

Research and Education Campus Facilities Radioactive Waste Management Basis and DOE Manual 435.1-1 Compliance Tables

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**Research and Education Campus Facilities
Radioactive Waste Management Basis and DOE
Manual 435.1-1 Compliance Tables**

November 2011

**Idaho National Laboratory
Idaho Falls, Idaho 83415**

<http://www.inl.gov>

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ABSTRACT

U.S. Department of Energy Order 435.1, “Radioactive Waste Management,” along with its associated manual and guidance, requires development and maintenance of a radioactive waste management basis for each radioactive waste management facility, operation, and activity. This document presents a radioactive waste management basis for Idaho National Laboratory Research and Education Campus facilities that manage radioactive waste. The radioactive waste management basis for a facility comprises existing laboratory-wide and facility-specific documents. Department of Energy Manual 435.1-1, “Radioactive Waste Management Manual,” facility compliance tables also are presented for the facilities. The tables serve as a tool to develop the radioactive waste management basis.

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1. INTRODUCTION

The U.S. Department of Energy (DOE) ensures that DOE radioactive waste is managed in a manner that is protective of worker and public health and the environment through DOE Order 435.1, “Radioactive Waste Management,” and its associated manual (DOE Manual 435.1-1, “Radioactive Waste Management Manual”) and guidance (DOE Guide 435.1-1, “Implementation Guide for Use with DOE M 435.1-1”). As required by DOE Manual 435.1-1, I.F.(2), field element managers are responsible for ensuring that a radioactive waste management basis (RWMB) is developed and maintained for each DOE radioactive waste management facility, operation, and activity. The RWMB must do the following:

- Reference or define the conditions under which the facility may operate based on the radioactive waste management documentation
- Include the applicable elements identified in the specific waste type chapters of the manual (DOE Manual 435.1-1)
- Be developed using the graded approach process.

The specific waste type chapters of DOE Manual 435.1-1 are high-level waste (Chapter II), transuranic (TRU) waste (Chapter III), and low-level waste (LLW) (Chapter IV). The RWMB is required to consist of “physical and administrative controls to ensure the protection of workers, the public, and the environment.” For TRU waste and LLW, the RWMB is to include the following specific waste management controls:

- For generators, the waste certification program
- For treatment facilities and storage facilities, the waste acceptance requirements and the waste certification program
- For disposal facilities, the performance assessment, composite analysis, disposal authorization statement, closure plan, waste acceptance requirements, and monitoring plan.

Similar waste management controls are specified for high-level waste generators and high-level waste pretreatment, treatment, and storage facilities.

However, consistent with the graded approach provided in the DOE guidance, the required elements of the RWMB vary with the type of waste management operation or facility and the types of hazards associated with the facility. Therefore, the elements that are included in the guidance for each waste type chapter of the manual are not to be considered a complete list of elements. For example, the elements determined to be applicable to the RWMB for a facility may include the facility safety basis; authorization basis; operational procedures; radiation protection controls and procedures; waste characterization and certification plan; waste acceptance criteria; waste tracking and records management; waste storage and staging requirements; facility monitoring; quality assurance; and regulatory permits and appropriate documentation for permitted facilities.

The purpose of this document is to present a RWMB for Research and Education Campus (REC) facilities that manage radioactive waste and DOE Manual 435.1-1 facility compliance information tables for the REC facilities. The facility RWMB comprises existing laboratory-wide and facility-specific documents. The DOE Manual 435.1-1 facility compliance information tables show how each facility meets the DOE Manual 435.1-1 requirement for a waste type and serve as a tool to develop the RWMB. The tables provide information that BEA and facility management officials can use to apply the graded

approach emphasized in DOE Order 435.1 and its associated manual and guidance. This document is intended to support the summary RWMB (PLN-3655) for the facilities managing radioactive waste at the REC. The summary RWMB is to be submitted to the DOE field element manager for approval.

2. METHODOLOGY

The following methodology was used to prepare preliminary RWMB and facility compliance information tables for the REC facilities:

- A kick-off meeting was held with REC officials. At this meeting, a preliminary list of REC facilities that should be included in this effort was verified. Based on the information obtained at this meeting, the list of facilities was modified slightly. The REC officials also provided the point of contact (POC) for each facility that could provide facility radioactive waste management information.
- Interviews were conducted with the primary POCs to discuss radioactive waste management procedures and programs at each facility. The interviews were conducted on June 17, 2010.
- Based on the information received from the interviews and analysis of the procedures cited by the facility POCs and found through the Electronic Document Management System, initial draft tables describing facility-level compliance with DOE Manual 435.1-1 requirements for each facility and each waste type managed at the facility were developed.
- A review meeting was conducted with the facility POCs and BEA management officials. This review meeting served as verification of the information presented in the initial draft tables, which were based on the information obtained from the POC interviews and analysis of documents from the Electronic Document Management System. The meeting also allowed the BEA management officials to discuss and make decisions regarding the potential compliance issues identified in the tables. The BEA management officials determined areas where BEA would take further actions and also areas where further actions were not necessary (e.g., issues where the BEA management officials decided that sufficient compliance was provided by Idaho National Laboratory (INL)-wide procedures or programs. The review meeting was held on July 13, 2010.
- The tables were revised based on the input received during the review meeting.
- For each facility, a preliminary RWMB and a list of areas requiring further BEA and facility management actions were developed based on information from the revised tables.

In developing and reviewing the compliance information and preliminary RWMB, the graded approach that DOE specifies for developing the RWMB and that is emphasized throughout the DOE 435.1-1 guidance was used. The guidance also states that, when possible, existing processes, programs, and documentation should be considered as possible ways to comply with DOE Manual 435.1-1 requirements (DOE Guide 435.1-1).

Both the manual and associated guidance were considered in developing and reviewing the preliminary RWMB. DOE Manual 435.1-1 describes the requirements and establishes specific responsibilities for implementing DOE Order 435.1 for the management of DOE high-level waste, TRU waste, LLW, and the radioactive component of mixed waste. DOE Guide 435.1-1 was developed to aid in implementing DOE Manual 435.1-1 requirements. The guide aids in understanding what is necessary to attain compliance, facilitates effective and efficient implementation of the requirements, and offers acceptable ways to implement the requirements. The guide is not meant to be viewed as additional or mandatory requirements. The guide emphasizes consideration of situation-specific attributes and application of the graded approach to dictate the rigor applied to implementation (DOE Guide 435.1-1 and DOE Manual 435.1-1).

3. SCOPE

The following REC facilities were identified as managing radioactive waste and are included in this study:

- IF-603, Laboratory A6, Temporary Accumulation Area (TAA)
- IF-603, Laboratory A20
- IF-603, Laboratory C19
- IF-603, Laboratory 103
- IF-611, Laboratory 105
- IF-657, Radioactive Waste Storage Area.

4. FACILITY RADIOACTIVE WASTE MANAGEMENT BASIS AND DOE MANUAL 435.1-1 COMPLIANCE TABLES

This section presents the RWMB and DOE Manual 435.1-1 compliance tables for the following REC facilities:

- IF-603, Laboratory A6, TAA (Subsection 4.1)
- IF-603, Laboratory A20 (Subsection 4.2)
- IF-603, Laboratory C19 (Subsection 4.3)
- IF-603, Laboratory 103 (Subsection 4.4)
- IF-611, Laboratory 105 (Subsection 4.5)
- IF-657, Radioactive Waste Storage Area (Subsection 4.6).

For each REC building housing these facilities, a brief facility overview is provided. The overview includes a facility description, the facility's safety basis classification, the radioactive waste management activities and waste types for the facility, a list of the RWMB documents and programs for the facility, and a list of the compliance requirements needing further BEA management action.

The DOE Manual 435.1-1 compliance information table for each radioactive waste type managed at each REC facility also is provided for each facility. Each table shows the DOE Manual 435.1-1 requirement, facility compliance information for each requirement, and compliance issues for consideration by INL, BEA, and facility management, as appropriate. In some cases, excerpts from the DOE Guide 435.1-1 guidance associated with the DOE Manual 435.1-1 requirement are included. These excerpts are included to provide additional context and information about the requirement. However, the complete guidance citation should be consulted for decision-making.

4.1 IF-603, Laboratory A6, Temporary Accumulation Area

1. **Facility description:** IF-603 houses 58 primary laboratory modules arranged in four corridors. There are twenty modules in A corridor that are designated for chemistry and biological research, including recombinant DNA studies, precision chemical analyses, surface characterization of materials, geochemistry, and other small-scale research. In these modules, environmental control is of major importance and a high density of fume hoods and lab sinks are provided.

There are eighteen modules contained in B corridor designated for general purpose research. Activities include electronics design, optics, laser and holographic experiments, materials testing, nondestructive evaluation, chemistry, biology, a radiographic laboratory, and other small-scale

research. The modules are designed with fewer hoods and sinks and with greater emphasis on power supply and heat dissipation associated with these types of research.

Twenty modules in C corridor are designated for physics and engineering research. These modules house welding development, ceramics research, thermal-fluids experiments, development and testing of instrument designs, and engineering development of concepts. The design of these modules emphasizes the requirements for power and heat dissipation associated with these types of operations. The D corridor houses offices and a telephone and computer network switching room. It also provides an access portal to the biotechnology addition. The IF-603 laboratory modules identified as currently managing radioactive waste are A6, A20, C19, and 103. Laboratory A6 functions as a TAA for the mixed waste generated at Laboratories A20, C19, and 103.

2. **Hazard category:** Less-than-hazard-category-3 (LTHC3) radiological
3. **Radioactive waste managed at this facility:** Mixed low-level waste is staged in this TAA
4. **RWMB documents/programs:**
 - a) Safety basis/hazard analysis:
 - EDF-7862, “Hazard Classification for the INL Research Center (IRC)”
 - b) Laboratory-wide:
 - Form 441.A34, “INL Radiological Control Required Surveys”
 - LI-435, “Waste Management Routine Field Activities”
 - LRD-15001, “Radiological Control Manual”
 - LWP-13840, “Management of Issues, Observations, and Noteworthy Practices”
 - LWP-14002, “Timeout and Stop Work Authority”
 - LWP-15011, “Radioactive Material Areas and Radioactive Storage Areas”
 - LWP-17000, “Waste Management”
 - MCP-139, “Radiological Surveys”
 - MCP-17000, “Waste Generator Services Waste Management”
 - MCP-17410, “Management of Waste Storage Areas”
 - MCP-17500, “Waste Generator Services Certification of Waste Shipments to the Nevada Test Site”
 - PDD-17000, “Waste Management Program”
 - PLN-114, “INL Emergency Plan/RCRA Contingency Plan”
 - PLN-522, “Quality Assurance Program Plan for the Waste Management/Waste Certification Program”
 - c) Facility-specific:
 - IAG-IF-603, “Tenant Use Agreement Between Operations and Maintenance Services and Research and Development (R&D) Tenants at the Science and Technology Campus (STC) IF-603 INL Research Campus Laboratory Building (IRC-L)”

LLW is managed at this facility. Table 1 presents the facility compliance information for Chapter IV, “Low-level Waste Requirements.”

Table 1. IF-603, Laboratory A6, Temporary Accumulation Area, DOE Manual 435.1-1 low-level waste requirements and facility compliance information.

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>A. <u>Definition of Low-Level Waste</u>. Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the <i>Atomic Energy Act of 1954</i>, as amended), or naturally occurring radioactive material.</p> <p>(From DOE G 435.1-1 Chapter IV: Low-level radioactive waste is defined by what it is not. The guidance on definitions in Chapters II and III should be consulted first for making a determination on how to properly manage a suspect waste stream.)</p>	<p>This requirement provides the criteria for determining which DOE radioactive waste is to be managed as LLW in accordance with DOE Manual 435.1-1, Chapter IV.</p> <p>Radioactive waste managed at this facility under the requirements of this chapter is not managed under the requirements of DOE Manual 435.1-1, Chapter II or Chapter III.</p>
<p>B. <u>Management of Specific Wastes</u>. The following provide for management of specific wastes as low-level waste in accordance with the requirements in this Chapter:</p>	<p>See (1), (2), (3), (4) below.</p>
<p>(1) <u>Mixed Low-Level Waste</u>. Low-level waste determined to contain both source, special nuclear, or byproduct material subject to the <i>Atomic Energy Act of 1954</i>, as amended, and a hazardous component subject to the <i>Resource Conservation and Recovery Act</i> (RCRA), as amended, shall be managed in accordance with the requirements of RCRA and DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p>	<p>This facility manages mixed LLW by serving as a TAA for the laboratories in IF-603. Management of TAAs is addressed in MCP-17410, and overall management of mixed waste is addressed in MCP-17000.</p>
<p>(2) <u>TSCA-Regulated Waste</u>. Low-level waste containing polychlorinated biphenyls, asbestos, or other such regulated toxic components shall be managed in accordance with requirements derived from the <i>Toxic Substances Control Act</i>, as amended, DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p>	<p>Not applicable (NA). This facility does not manage TSCA-regulated waste.</p>
<p>(3) <u>Accelerator-Produced Waste</u>. Radioactive waste produced as a result of operations of DOE accelerators is low-level waste and shall be managed in accordance with DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual, and all applicable Federal or State requirements.</p>	<p>NA; this facility does not manage accelerator-produced waste.</p>
<p>(4) <u>11e.(2) and Naturally Occurring Radioactive Material</u>. Small quantities of 11e.(2) byproduct material and naturally occurring radioactive material may be managed as low-level waste provided they can be managed to meet the requirements for low-level waste disposal in Section IV.P of this Manual.</p>	<p>NA; this facility does not manage naturally occurring radioactive material.</p>
<p>C. <u>Complex-Wide Low-Level Waste Management Program</u>. A complex-wide program and plan shall be developed as described under <i>Responsibilities</i>, 2.B and 2.D, in Chapter I of this Manual.</p>	<p>Not a facility-specific requirement. DOE Manual 435.1-1 §I.2.B and §I.2.D apply to the Assistant Secretary for Environmental Management and the Deputy Assistant Secretary for Waste Management, respectively.</p>

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>D. Radioactive Waste Management Basis. Low-level waste facilities, operations, and activities shall have a radioactive waste management basis consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment. The following specific waste management controls shall be part of the radioactive waste management basis:</p>	<p>The RWMB provides the regulatory framework for management of radioactive waste at INL. It specifically identifies facility management and implementing documents for the generation, storage, treatment, and disposal of radiological waste.</p>
<p>(1) Generators. The waste certification program.</p> <p>From DOE G 435.1-1 Chapter IV: For a facility that generates low-level waste, the radioactive waste management basis is to include the program for certifying that waste meets the waste acceptance requirements of the facility(ies) to which the waste will be sent.</p>	<p>NA; this facility does not generate LLW.</p>
<p>(2) Treatment Facilities. certification program. The waste acceptance requirements and the waste [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	<p>NA; LLW is not treated at this facility.</p>
<p>(3) Storage Facilities. The waste acceptance requirements and the waste certification program.</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste</p>	<p>NA; this facility stages waste in accordance with N.(7) to facilitate treatment or disposal.</p> <p>EDF-7862 establishes the laboratory facilities at the IF-603 facility as LTHC3 facilities.</p>

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	
(4) Disposal Facilities. The performance assessment, composite analysis, disposal authorization statement, closure plan, waste acceptance requirements, and monitoring plan.	NA; this facility is not a disposal facility.
E. <u>Contingency Actions</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(5)].	DOE Manual 435.1-1 §I.1.E(5) addresses the sitewide emergency management system. The INL plan is provided in PLN-114.
<p>(1) Contingency Storage. For off-normal or emergency situations involving high activity or high hazard liquid low-level waste storage or treatment, spare capacity with adequate capabilities shall be maintained to receive the largest volume of liquid contained in any one storage tank or treatment facility. Tanks or other facilities that are designated low-level waste contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, Radioactive Waste Management, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store liquid LLW.
(2) Transfer Equipment. Pipelines and auxiliary facilities necessary for the transfer of high activity or high hazard liquid low-level waste to contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	NA; this facility does not store or treat liquid LLW.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.	
<p>F. <u>Corrective Actions</u>. I of this Manual. The following requirements are in addition to those in Chapter [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with DOE M 435.1-1 §I.2.G.(1) is demonstrated by records showing what corrective actions were taken to remedy situations in the radioactive waste management system.</p> <p>Compliance with DOE M 435.1-1 §I.2.G.(2) is demonstrated by having the necessary procedures, mechanisms, and training in place to effect shutdown or curtailment of activities which pose an imminent danger or other serious hazard to workers or the public, or are not protective of the environment.</p>	<p>The INL-wide procedure addressing problem identification as required by DOE Manual 435.1-1 §I.2.G.(1) is LWP-13840, which implements the laboratory's corrective action system.</p> <p>The INL-wide procedure addressing shutdown or curtailment of activities as required by DOE Manual 435.1-1 §I.2.G.(2) is LWP-14002.</p>
<p>(1) Order Compliance. Corrective actions shall be implemented whenever necessary to ensure the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual are met.</p> <p>From DOE G 435.1-1 Chapter IV: If a facility or activity can be allowed to operate while a noncompliant or hazardous condition exists, the allowance and any associated limitations must be defined as part of the facility or activity's radioactive waste management basis, identified as a configuration controlled item in a configuration management plan or included in a revision or modification to an operating procedure or similar controlled documentation.</p> <p>Compliance with this requirement is demonstrated if a corrective action system addresses noncompliant or hazardous situations involving low-level waste management facilities in a systematic fashion, and allows identification of problems by all personnel.</p>	See F. above.
<p>(2) Operations Curtailment. Operations shall be curtailed or facilities shut down for failure to establish, maintain, or operate consistent with an approved radioactive waste management basis.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated with a documented system of routine assessments to determine whether</p>	The approved RWMB establishes the current compliance status at each radioactive waste management facility. Facility assessments are scheduled to ensure waste management activities are conducted in accordance with the approved RWMB.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
waste management activities and facilities are operating in accordance with an approved radioactive waste management basis that provides for graded limitations that can be placed on activities and operations that do not have, or are operating outside of, an approved radioactive waste management basis, including shutdown of the facility.	
G. <u>Waste Acceptance</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(6)].	DOE Manual 435.1-1 §I.2.F(6) applies to field element managers.
<p>(1) Technical and Administrative. Waste acceptance requirements for all low-level waste storage, treatment, or disposal facilities, operations, and activities shall specify, at a minimum, the following:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these waste acceptance requirements is demonstrated if they are documented, contain clear and precise criteria specifying the radionuclide limits in the form of contents or concentrations that can be accepted, the limitations and prohibitions on waste forms and packages that can be received, and the limits, prohibitions, or instructions concerning any other technical information so that the waste is compatible with the safety basis of the facility, and which will result in acceptable waste at subsequent steps in managing the low-level waste.</p>	<p>EDF-7862 establishes the facility as a LTHC3 facility.</p> <p>IAG-IF-603 requires the facility manager to implement a method of tracking and controlling the radioactive material inventory so that the sum-of-the-ratios does not exceed 1. Appendix A requires that the radioactive materials inventory for the facility never exceed the Hazard Category 3 threshold quantity values.</p> <p>The RMSA custodian manages LLW in accordance with MCP-17000.</p>
(a) Allowable activities and/or concentrations of specific radionuclides.	See (1) above.
(b) Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal.	See (1) above.
(c) Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance.	See (1) above.
(d) The following are additional waste acceptance requirements that shall be specified in low-level waste disposal facility waste acceptance requirements:	See (1) above.
1 Low-level waste must contribute to and not detract from achieving long-term stability of the facility, minimizing the need for long-term active maintenance, minimizing subsidence, and minimizing contact of water with waste. Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical.	See (1) above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
2 Liquid low-level waste or low-level waste containing free liquid must be converted into a form that contains as little freestanding liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the waste volume when the low-level waste is in a disposal container, or 0.5 percent of the waste volume after it is processed to a stable form.	See (1) above.
3 Low-level waste must not be readily capable of detonation or of explosive decomposition or reaction at anticipated pressures and temperatures, or of explosive reaction with water. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.	See (1) above.
4 Low-level waste must not contain, or be capable of generating by radiolysis or biodegradation, quantities of toxic gases, vapors, or fumes harmful to the public or workers or disposal facility personnel, or harmful to the long-term structural stability of the disposal site.	See (1) above.
5 Low-level waste in a gaseous form must be packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20 C. [sic]	See (1) above.
<p>(e) The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.</p> <p>From DOE G 435.1-1 Chapter IV: Waste acceptance requirements are acceptable if they are documented and contain a clear description of the procedure and bases for obtaining an exception or deviation to the acceptance criteria for low-level waste to be received at the facility.</p>	See (1) above.
<p>(2) Evaluation and Acceptance. The receiving facility shall evaluate waste for acceptance, including confirmation that the technical and administrative requirements have been met. A process for the disposition of non-conforming wastes shall be established.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the waste acceptance requirements for a low-level waste management facility is demonstrated if they include a process for evaluation and acceptance of incoming waste to ensure the acceptance criteria of the facility receiving the waste are met that includes one of or a combination of: (1) testing, sampling, and analysis of representative samples of waste upon receipt; (2)</p>	See (1) above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
testing, sampling, and analysis of split samples of waste taken at the generator site; (3) evaluation of testing, sampling, and analysis of data provided by the generator, or (4) audits, reviews, surveillance, or observations of generator waste certification programs and characterization activities. Additionally, acceptable waste acceptance requirements for a storage, treatment or disposal facility will have documented procedures and actions to be taken if a waste that does not conform to the waste acceptance criteria is received at the facility.	
H. <u>Waste Generation Planning</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(7)].	DOE Manual 435.1-1 §I.2.F(7) applies to field element managers.
(1) <u>Life-Cycle Planning</u> . Prior to waste generation, planning shall be performed to address the entire life cycle for all low-level waste streams. From DOE G 435.1-1 Chapter IV: Compliance with this planning requirement is demonstrated by the individual sites establishing a process for evaluating the life-cycle of low-level waste prior to its generation, including the identification of low-level wastes with no path to disposal and appropriate records justifying the newly generated low-level waste stream(s), and site personnel possessing planning information showing the location(s) where low-level waste will be stored, treated, and/or disposed along with a confirmation that the personnel managing the facilities agree that the low-level waste may be managed at those facilities.	PDD-17000 and LWP-17000 provide direction to the waste generators for waste generation planning to address the entire life cycle.
(2) <u>Waste with No Identified Path to Disposal</u> . Low-level waste streams with no identified path to disposal shall be generated only in accordance with approved conditions which, at a minimum, shall address:	This facility is not generating radioactive waste that does not have an identified path to disposal.
(a) Programmatic need to generate the waste;	See (2) above.
(b) Characteristics and issues preventing the disposal of the waste;	See (2) above.
(c) Safe storage of the waste until disposal can be achieved; and	See (2) above.
(d) Activities and plans for achieving final disposal of the waste.	See (2) above.
I. <u>Waste Characterization</u> . Low-level waste shall be characterized using direct or indirect methods, and the characterization documented in sufficient detail to ensure safe management and compliance with the waste acceptance requirements of the facility receiving the waste.	MCP-17000 §4 specifies the requirements for preparing an Integrated Waste Tracking System (IWTS) profile that captures waste characterization information.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program for documenting and the existence of records that document the process for acquiring and verifying the validity of low-level waste characterization data acquired through the use of direct or indirect methods.	
<p>(1) Data Quality Objectives. The data quality objectives process, or a comparable process, shall be used for identifying characterization parameters and acceptable uncertainty in characterization data.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the documented use of a data quality objectives or a comparable process for determining the type, quantity, and quality of characterization data needed to safely manage low-level waste.</p>	Radioactive waste management facilities characterize waste in accordance with the requirements of the receiving storage, treatment, or disposal facility. The documented use of a data quality objectives process, or comparable process, was not identified for this facility.
<p>(2) Minimum Waste Characterization. Characterization data shall, at a minimum, include the following information relevant to the management of the waste:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the existence of a program or procedure for determining and records that document characterization of low-level waste consistent with the minimum characterization data requirements.</p>	MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.
(a) Physical and chemical characteristics;	See (2) above.
(b) Volume, including the waste and any stabilization or absorbent media;	See (2) above.
(c) Weight of the container and contents;	See (2) above.
(d) Identities, activities, and concentrations of major radionuclides;	See (2) above.
(e) Characterization date;	See (2) above.
(f) Generating source; and	See (2) above.
(g) Any other information which may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives.	See (2) above.
<p>J. <u>Waste Certification</u>. A waste certification program shall be developed, documented, and implemented to ensure that the waste acceptance requirements of facilities receiving low-level waste for storage, treatment, and disposal are met.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the development and documentation portion of the</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste certification information.</p> <p>MCP-17500 provides the Waste Generator Services (WGS) waste certification program for LLW to be shipped to the Nevada National Security Site (NNSS).</p>

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
certification requirement is demonstrated by a waste certification plan that identifies the organizations involved, assigns responsibilities for implementing the program, and describes or references the quality assurance, training, procurement controls, records management, and procedures to be used by the program. Acceptable performance for implementing the program is demonstrated when appropriate personnel are trained and follow the procedures that govern their part of the waste certification. Additionally, acceptable performance is demonstrated if the waste certification plan and procedures are current and controlled in accordance with a document controls program, and records related to certification (e.g., certification statements, training records, procurement records, characterization records, container records) are generated and managed in accordance with the established site program.	<p>Container procurement is addressed in MCP-17000 §4.6.</p> <p>Waste certification is performed and tracked using IWTS. Documentation of the IWTS Program is available electronically only.</p> <p>PLN-522 requires waste technical specialists and waste disposition specialists to complete the appropriate training/qualification before being granted approval authority for profiles within the IWTS Program. The waste certification official, alternate waste certification official, and NNSS packaging certifiers must complete the appropriate training/qualifications to disposition waste to NNSS.</p>
<p>(1) Certification Program. The waste certification program shall designate the officials who have the authority to certify and release waste for shipment; and specify what documentation is required for waste generation, characterization, shipment, and certification. The program shall provide requirements for auditability, retrievability, and storage of required documentation and specify the records retention period.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure for record keeping and records showing that low-level waste is certified as having met the waste acceptance criteria of the facility to which it was transferred and that the certification statement is supported by additional records regarding the waste source, characterization, and container.</p>	See J. above.
<p>(2) Certification before Transfer. Low-level waste shall be certified as meeting waste acceptance requirements before it is transferred to the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the presence of a certification program which includes procedures requiring a signed certification statement prior to the release of waste for transfer, and by dated records showing that waste was certified before being transferred.</p>	See J. above.
<p>(3) Maintaining Certification. Low-level waste that has been certified as meeting the waste acceptance requirements for transfer to a storage, treatment, or disposal facility shall be managed in a manner that</p>	See J. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>maintains its certification status.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure reflecting this requirement is present and site personnel are able to show that the storage of low-level waste containers is in a facility or manner where the containers would not be damaged by normal weather events, and cannot be accessed by unauthorized personnel. Further, each container can be traced to its certification and the information supporting that certification.</p>	
<p>K. Waste Transfer. A documented process shall be established and implemented for transferring responsibility for management of low-level waste and for ensuring availability of relevant data. The following requirements are in addition to those in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if facilities have procedures for the receipt of waste and the transfer of waste, as appropriate, which address the acquisition of waste and container data and the transfer of ownership, respectively. Further evidence of acceptable performance is facility records showing that data on the waste containers is available and accurate, and that documented transfer of responsibility occurs.</p>	<p>MCP-17000 specifies the requirements for preparing an IWTS profile that captures waste certification data, transfer information, and associated authorizations.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p>
<p>(1) Authorization. Low-level waste shall not be transferred to a storage, treatment, or disposal facility until personnel responsible for the facility receiving the waste authorize the transfer.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by sites having procedures that require a confirmation of authorization before releasing waste for transfer, and records showing that transfers are made in accordance with written authorizations.</p>	See K. above.
<p>(2) Data. Waste characterization data, container information, and generation, storage, treatment, and transportation information for low-level waste shall be transferred with or be traceable to the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if there are procedures requiring that characterization and container data be provided and maintained for each low-level waste transfer and documented records of transfers show that the information is being provided.</p>	See K. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
L. <u>Packaging and Transportation</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(11)].	DOE Manual 435.1-1 §I.1.E(11) applies to field element managers.
(1) Packaging. If containers are used: From DOE G 435.1-1 Chapter IV: Compliance with the packaging requirement is demonstrated by: (1) procedures which document proper packaging protocols; and (2) no trends of routine repackaging of low-level waste that is packaged after issuance of DOE O 435.1. Successful performance of this requirement is also demonstrated by a record of containers for which failure has not routinely occurred under management conditions. It is recognized that there may be failed containers for waste previously placed in storage. For those containers, the goal is to only have to repack the waste one time after it is retrieved and characterized. Further, acceptable performance is demonstrated by containers of waste having marking and labeling that allows correlation with waste characterization data and container information.	MCP-17000 §4. addresses packaging requirements.
(a) Low-level waste shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	See (1) above.
(b) When waste is packaged, vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container.	See (1) above.
(c) Containers of low-level waste shall be marked such that their contents can be identified.	See (1) above.
(2) Transportation. To the extent practical, the volume of waste and number of low-level waste shipments shall be minimized. From DOE G 435.1-1 Chapter IV: Compliance with this requirement can be demonstrated by a combination of site procedures directing the efficient use of waste container capacity and documentation showing that low-level waste shipments are systematically planned and optimized to the extent practical.	NA; waste is not shipped from this facility to an offsite facility for final disposition.
M. <u>Site Evaluation and Facility Design</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this requirement addresses new radioactive waste management facilities.
(1) Site Evaluation. Proposed locations for low-level waste facilities shall be evaluated to identify relevant features that should be avoided or must be considered	See M. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
in facility design and analyses.	
(a) Each site proposed for a new low-level waste facility or expansion of an existing low-level waste facility shall be evaluated considering environmental characteristics, geotechnical characteristics, and human activities, including for a low-level waste disposal facility, the capability of the site to demonstrate, at a minimum, whether it is:	See M. above.
1 Located to accommodate the projected volume of waste to be received;	See M. above.
2 Located in a flood plain, a tectonically active area, or in the zone of water table fluctuation; and	See M. above.
3 Located where radionuclide migration pathways are predictable and erosion and surface runoff can be controlled.	See M. above.
(b) Proposed sites with environmental characteristics, geotechnical characteristics, and human activities for which adequate protection cannot be provided through facility design shall be deemed unsuitable for the location of the facility.	See M. above.
(c) Low-level waste disposal facilities shall be sited to achieve long-term stability and to minimize, to the extent practical, the need for active maintenance following final closure.	See M. above.
(2) Low-Level Waste Treatment and Storage Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	See M. above.
1 Design of low-level waste treatment and storage facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a non-flammable and nonexplosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
(c) Consideration of Decontamination and Decommissioning. Areas in new and modifications to existing low-level waste management facilities that are subject to contamination with radioactive or other hazardous materials shall be designed to facilitate decontamination. For such facilities a proposed decommissioning method or a conversion method leading to reuse shall be described.	See M. above.
(d) Instrumentation and Control Systems. Engineering controls shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide volume inventory data and to prevent spills, leaks, and overflows from tanks or confinement systems.	See M. above.
(e) Monitoring. Monitoring and/or leak detection capabilities shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide rapid identification of failed confinement and/or other abnormal conditions.	See M. above.
(3) Low-Level Waste Disposal Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	
1 Design of low-level waste disposal facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a nonflammable and non-explosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Stability. Low-level waste disposal facilities shall be designed to achieve long-term stability and to minimize to the extent practical, the need for active maintenance following final closure.	See M. above.
(d) Control of Water. Low-level waste disposal facilities shall be designed to minimize to the extent	See M. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
practical, the contact of waste with water during and after disposal.	
N. <u>Storage and Staging</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(13)].	DOE Manual 435.1-1 §I.2.F(13) applies to field element managers.
<p>(1) Storage Prohibitions. Low-level waste in storage shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water. Prior to storage, pyrophoric materials shall be treated, prepared, and packaged to be nonflammable.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by having waste acceptance requirements which prohibit low-level waste that is ignitable or explosive from being accepted for storage unless it has been treated, and procedures for properly preparing such materials for safe storage.</p>	NA; this facility does not store LLW.
<p>(2) Storage Limit. Low-level waste that has an identified path to disposal shall not be stored longer than one year prior to disposal, except for storage for decay, or as otherwise authorized by the Field Element Manager.</p> <p>From DOE G 435.1-1 Chapter IV: Storage longer than one year can be justified if the conditions for such storage are approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Storage for radioactive decay for a period greater than 1 year for waste that has an identified path to disposal is allowed. Adequate justification and the supporting information for storage for decay is to be documented in the radioactive waste management basis for the facility in which the storage will take place.</p> <p><u>Mixed waste</u>. Under the Federal Facility Compliance Act of 1992, DOE sites were required to develop Site Treatment Plans to bring stored mixed low-level waste into compliance with these requirements. The Site Treatment Plan needs to be consulted and any mixed low-level waste stored for the purpose of accumulation to facilitate treatment must meet Resource Conservation and Recovery Act storage requirements. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement and include appropriate provisions in the radioactive waste management basis for the facility in which it is stored.</p>	NA; this facility does not store LLW. See N. (7) below for staging requirements.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
<p><u>Legacy waste.</u> As discussed above, the intention of the requirement is not to force malicious compliance or heroic actions which would result in increased risk or safety concerns. Rather, the intention is that waste in storage longer than one year receives additional attention to ensure that the public, the workers, and the environment are protected from the hazards of the waste, and that progress is being made to dispose of the waste. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement:</p> <p>1) the radioactive waste management basis allows for storage for no more than one year.</p> <p>2) the radioactive waste management basis allows for storage for no more than one year, or for storage for decay only for periods greater than a year, which are specified on a radionuclide basis.</p> <p>3) the radioactive waste management basis allows for storage for more than one year, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>4) the radioactive waste management basis allows for storage for decay (with specifics) and for storage for more than one year for other low-level waste, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>Compliance with this requirement is demonstrated by the existence of a radioactive waste management basis for the storage facility approved by the Field Element Manager that includes the time frames that waste are allowed to be stored, the necessary justifications for storage for decay, and the necessary technical evaluations if storage is to extend significantly beyond the one-year time frame.</p>	
(3) Storage Integrity. Low-level waste shall be stored in a location and manner that protects the integrity of waste for the expected time of storage and minimizes worker exposure.	NA; this facility does not store LLW. See N. (7) below for staging requirements.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>From DOE G 435.1-1 Chapter IV: However, in making a decision to use a facility for storage and in developing a radioactive waste management basis for the activity, particular attention to protection of workers is needed.</p> <p>Compliance with this requirement is demonstrated if sites have storage capabilities for low-level waste that provide protection to waste containers so that their integrity will not be damaged through physical or chemical (corrosion) processes and that keep personnel from spending extended periods of time in the areas where low-level waste is stored.</p>	
(4) Waste Characterization for Storage.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(a) Low-level waste that does not have an identified path to disposal shall be characterized as necessary to meet the data quality objectives and minimum characterization requirements of this Chapter, to ensure safe storage, and to facilitate disposal.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
<p>(b) Characterization information for all low-level waste in storage shall be maintained as a record in accordance with the requirements for Records Management in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by documented procedures for managing waste characterization and container information on low-level waste as a Federal record. The records are managed per the applicable policies and procedures for records management referenced in DOE O 200.1 and established at the applicable Field Element.</p>	NA; this facility does not store LLW. See N. (7) below for staging requirements.
<p>(5) Container Inspection. A process shall be developed and implemented for inspecting and maintaining containers of low-level waste to ensure container integrity is not compromised.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by: (1) a documented process for waste container inspection and maintenance; and (2) documentation for all waste container inspections and maintenance actions performed.</p>	LI-435 requires quarterly inspections of radioactive waste containers if waste is stored outdoors or has been in storage for greater than 1 year.
(6) Storage Management. Low-level waste storage shall be managed to identify and segregate low-level waste from mixed low-level waste.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(7) Staging. Staging of low-level waste shall be for the purpose of the accumulation of such quantities of waste	Routine mixed LLW, such as personnel protective equipment, is accumulated at this facility for disposal.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>as necessary to facilitate transportation, treatment, and disposal. Staging longer than 90 days shall meet the requirements for storage above and in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: The staging of low-level waste needs to be addressed in the radioactive waste management basis for the facility that is performing the staging. Generators, treatment facilities, and disposal facilities that stage waste must ensure that the action of staging is included and authorized as part of their radioactive waste management basis for the affected facilities, operations, or activities.</p> <p>Staging longer than 90 days must be justified, the conditions for such storage met, and these practices approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Compliance with this requirement is demonstrated by a staging program that limits the temporary storage of waste to only circumstances allowed in the requirement, including justifications for any staging that exceeds the 90-day period, which is documented in the radioactive waste management basis for the facility.</p>	<p>MCP-17000, Appendix F, "Container Start Date and Storage Prohibitions," restricts staging LLW to 90 days maximum at any generator or treatment facility prior to acceptance by a storage facility.</p> <p>As stated in DOE Guide 435.1-1 §IV.N.(7), staging waste in accordance with this requirement allows waste to be accumulated without being considered storage and being bound by the associated storage requirements.</p>
<p>O. <u>Treatment</u>. Low-level waste treatment to provide more stable waste forms and to improve the long-term performance of a low-level waste disposal facility shall be implemented as necessary to meet the performance objectives of the disposal facility.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated when a treatment facility or process ensures that treated waste will meet the minimum waste form requirements of DOE M 435.1 and meet additional disposal facility-specific waste acceptance requirements for additional stability or long-term performance of facilities that will receive the treated waste.</p>	<p>NA; this facility does not treat LLW.</p>
<p>P. <u>Disposal</u>. Low-level waste disposal facilities shall meet the following requirements.</p>	<p>NA; this facility does not dispose of LLW.</p>
<p>(1) Performance Objectives. Low-level waste disposal facilities shall be sited, designed, operated, maintained, and closed so that a reasonable expectation exists that the following performance objectives will be met for waste disposed of after September 26, 1988:</p>	<p>See P. above.</p>
<p>(a) Dose to representative members of the public shall not exceed 25 mrem (0.25 mSv) in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air.</p>	<p>See P. above.</p>
<p>(b) Dose to representative members of the public via</p>	<p>See P. above.</p>

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
the air pathway shall not exceed 10 mrem (0.10 mSv) in a year total effective dose equivalent, excluding the dose from radon and its progeny.	
(c) Release of radon shall be less than an average flux of 20 pCi/m ² /s (0.74Bq/m ² /s) at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/l (0.0185 Bq/l) of air may be applied at the boundary of the facility.	See P. above.
(2) Performance Assessment. A site-specific radiological performance assessment shall be prepared and maintained for DOE low-level waste disposed of after September 26, 1988. The performance assessment shall include calculations for a 1,000 year period after closure of potential doses to representative future members of the public and potential releases from the facility to provide a reasonable expectation that the performance objectives identified in this Chapter are not exceeded as a result of operation and closure of the facility.	See P. above.
(a) Analyses performed to demonstrate compliance with the performance objectives in this Chapter, and to establish limits on concentrations of radionuclides for disposal based on the performance measures for inadvertent intruders in this Chapter shall be based on reasonable activities in the critical group of exposed individuals. Unless otherwise specified, the assumption of average living habits and exposure conditions in representative critical groups of individuals projected to receive the highest doses is appropriate. The likelihood of inadvertent intruder scenarios may be considered in interpreting the results of the analyses and establishing radionuclide concentrations, if adequate justification is provided.	See P. above.
(b) The point of compliance shall correspond to the point of highest projected dose or concentration beyond a 100 meter buffer zone surrounding the disposed waste. A larger or smaller buffer zone may be used if adequate justification is provided.	See P. above.
(c) Performance assessments shall address reasonably foreseeable natural processes that might disrupt barriers against release and transport of radioactive materials.	See P. above.
(d) Performance assessments shall use DOE-approved dose coefficients (dose conversion factors) for internal and external exposure of reference adults.	See P. above.
(e) The performance assessment shall include a sensitivity/uncertainty analysis.	See P. above.
(f) Performance assessments shall include a	See P. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
demonstration that projected releases of radionuclides to the environment shall be maintained as low as reasonably achievable (ALARA).	
(g) For purposes of establishing limits on radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts to water resources.	See P. above.
(h) For purposes of establishing limits on the concentration of radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts calculated for a hypothetical person assumed to inadvertently intrude for a temporary period into the low-level waste disposal facility. For intruder analyses, institutional controls shall be assumed to be effective in deterring intrusion for at least 100 years following closure. The intruder analyses shall use performance measures for chronic and acute exposure scenarios, respectively, of 100 mrem (1 mSv) in a year and 500 mrem (5 mSv) total effective dose equivalent excluding radon in air.	See P. above.
(3) Composite Analysis. For disposal facilities which received waste after September 26, 1988, a site-specific radiological composite analysis shall be prepared and maintained that accounts for all sources of radioactive material that may be left at the DOE site and may interact with the low-level waste disposal facility, contributing to the dose projected to a hypothetical member of the public from the existing or future disposal facilities. Performance measures shall be consistent with DOE requirements for protection of the public and environment and evaluated for a 1,000 year period following disposal facility closure. The composite analysis results shall be used for planning, radiation protection activities, and future use commitments to minimize the likelihood that current low-level waste disposal activities will result in the need for future corrective or remedial actions to adequately protect the public and the environment.	See P. above.
(4) Performance Assessment and Composite Analysis Maintenance. The performance assessment and composite analysis shall be maintained to evaluate changes that could affect the performance, design, and operating bases for the facility. Performance assessment and composite analysis maintenance shall include the conduct of research, field studies, and monitoring needed to address uncertainties or gaps in existing data. The performance assessment shall be updated to support the final facility closure. Additional iterations of the performance assessment and composite	See P. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
analysis shall be conducted as necessary during the post-closure period.	
(a) Performance assessments and composite analyses shall be reviewed and revised when changes in waste forms or containers, radionuclide inventories, facility design and operations, closure concepts, or the improved understanding of the performance of the waste disposal facility in combination with the features of the site on which it is located alter the conclusions or the conceptual model(s) of the existing performance assessment or composite analysis.	See P. above.
(b) A determination of the continued adequacy of the performance assessment and composite analysis shall be made on an annual basis, and shall consider the results of data collection and analysis from research, field studies, and monitoring.	See P. above.
(c) Annual summaries of low-level waste disposal operations shall be prepared with respect to the conclusions and recommendations of the performance assessment and composite analysis and a determination of the need to revise the performance assessment or composite analysis.	See P. above.
(5) Disposal Authorization. A disposal authorization statement shall be obtained prior to construction of a new low-level waste disposal facility. Field Elements with existing low-level waste disposal facilities shall obtain a disposal authorization statement in accordance with the schedule in the Complex-Wide Low-Level Waste Management Program Plan. The disposal authorization statement shall be issued based on a review of the facility's performance assessment, composite analysis, performance assessment and composite analysis maintenance, preliminary closure plan, and preliminary monitoring plan. The disposal authorization statement shall specify the limits and conditions on construction, design, operations, and closure of the low-level waste facility based on these reviews. A disposal authorization statement is a part of the radioactive waste management basis for a disposal facility. Failure to obtain a disposal authorization statement by the implementation date of this Order shall result in shutdown of the disposal facility.	See P. above.
(6) Disposal Facility Operations. The disposal facility design and operation must be consistent with the disposal facility closure plan and lead to disposal facility closure that provides a reasonable expectation that performance objectives will be met. Low-level waste shall be disposed in such a manner that achieves the performance objectives stated in this Chapter,	See P. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
consistent with the disposal facility radiological performance assessment. Additional requirements include:	
(a) Operating procedures shall be developed and implemented for low-level waste disposal facilities that protect the public, workers, and the environment; ensure the security of the facility; minimize subsidence during and after waste emplacement; achieve long-term stability and minimize the need for long-term active maintenance; and meet the requirements of the closure/post-closure plan.	See P. above.
(b) Permanent identification markers for disposal excavations and monitoring wells shall be emplaced.	See P. above.
(c) Low-level waste placement into disposal units shall minimize voids between waste containers. Voids within disposal units shall be filled to the extent practical. Uncontainerized bulk waste shall also be placed in a manner that minimizes voids and subsidence.	
(d) Operations are to be conducted so that active waste disposal operations will not have an adverse effect on any other disposal units.	See P. above.
(e) Operations shall include a process for tracking and documenting low-level waste placement in the facility by generator source.	See P. above.
(7) Alternate Requirements for Low-Level Waste Disposal Facility Design and Operation. Requirements other than those set forth in this Section for the design and operation of a low-level waste disposal facility may be approved on a specific basis if a reasonable expectation is demonstrated that the disposal performance objectives will be met.	See P. above.
Q. Closure. The following requirements are in addition to those in Chapter I of this Manual.	NA; this facility does not dispose of LLW.
(1) Disposal Facility Closure Plans. A preliminary closure plan shall be developed and submitted to Headquarters for review with the performance assessment and composite analysis. The closure plan shall be updated following issuance of the disposal authorization statement to incorporate conditions specified in the disposal authorization statement. Closure plans shall:	See Q. above.
(a) Be updated as required during the operational life of the facility.	See Q. above.
(b) Include a description of how the disposal facility will be closed to achieve long-term stability and minimize the need for active maintenance following	See Q. above.

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
closure and to ensure compliance with the requirements of DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	
(c) Include the total expected inventory of wastes to be disposed of at the facility over the operational life of the facility.	See Q. above.
(2) Disposal Facility Closure. Closure of a disposal facility shall occur within a five-year period after it is filled to capacity, or after the facility is otherwise determined to be no longer needed.	See Q. above.
(a) Prior to facility closure, the final inventory of the low-level waste disposed in the facility shall be prepared and incorporated in the performance assessment and composite analysis which shall be updated to support the closure of the facility.	See Q. above.
(b) A final closure plan shall be prepared based on the final inventory of waste disposed in the facility, the plan implemented, and the updated performance assessment and composite analysis prepared in support of the facility closure.	See Q. above.
(c) Institutional control measures shall be integrated into land use and stewardship plans and programs, and shall continue until the facility can be released pursuant to DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(d) The location and use of the facility shall be filed with the local authorities responsible for land use and zoning.	See Q. above.
R. Monitoring. The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(7)].	DOE Manual 435.1-1 §I.1.E(7) applies to field element managers.
<p>(1) All Waste Facilities. Parameters that shall be sampled or monitored, at a minimum, include: temperature, pressure (for closed systems), radioactivity in ventilation exhaust and liquid effluent streams, and flammable or explosive mixtures of gases. Facility monitoring programs shall include verification that passive and active control systems have not failed.</p> <p>From DOE G 435.1-1 Chapter IV: The minimum parameters specified in the requirement were selected based on their potential significance for anticipating and identifying undesirable conditions at low-level waste management facilities. Each facility's radioactive waste management basis should include an evaluation of the applicability and significance of the minimum parameters. This evaluation also needs to consider</p>	<p>Monitoring requirements at INL radioactive waste management facilities are tailored for the specific facility to enable timely indication of developing problems. Existing radiological control procedures and assessments are followed/completed to monitor waste facilities.</p> <p>LRD-15001 and MCP-139 specify methods and frequency of radiological control surveys of all radiological areas. MCP-139 specifies the use of Form 441.A34. This form is referred to as the "routine sheet" and is to be used by facility radiological control foremen to list radiological areas that are to be surveyed, the survey periods, and methods.</p>

Table 1. (continued).

Facility Name: IF-603, Laboratory A6, TAA	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>additional parameters to be sampled or monitored to ensure the protection of the public health, the environment, and the workers. If a minimum parameter specified in the requirement is deemed to be not applicable in any way to the active operation of that facility, then that justification should be included in the radioactive waste management basis and when approved constitutes an exemption to the manual.</p> <p>Verification activities are part of the radioactive waste management basis as a condition for operation and documented appropriately.</p> <p>Compliance with this requirement is demonstrated if monitoring or sampling for the stated parameters is performed for all facilities with a precision, accuracy, and frequency consistent with timely identification of developing problems and a justification exists in the approved radioactive waste management basis for those specified parameters which are not monitored or sampled.</p>	
(2) Liquid Waste Storage Facilities. For facilities storing liquid low-level waste, the following shall also be monitored: liquid level and/or waste volume, and significant waste chemistry parameters.	NA; liquid LLW is not stored in this facility.
(3) Disposal Facilities. A preliminary monitoring plan for a low-level waste disposal facility shall be prepared and submitted to Headquarters for review with the performance assessment and composite analysis. The monitoring plan shall be updated within one year following issuance of the disposal authorization statement to incorporate and implement conditions specified in the disposal authorization statement.	NA; this facility does not dispose of LLW.
(a) The site-specific performance assessment and composite analysis shall be used to determine the media, locations, radionuclides, and other substances to be monitored.	See (3) above.
(b) The environmental monitoring program shall be designed to include measuring and evaluating releases, migration of radionuclides, disposal unit subsidence, and changes in disposal facility and disposal site parameters which may affect long-term performance.	See (3) above.
(c) The environmental monitoring programs shall be capable of detecting changing trends in performance to allow application of any necessary corrective action prior to exceeding the performance objectives in this Chapter.	See (3) above.

4.2 IF-603, Laboratory A20

1. **Facility description:** See the IF-603 facility description provided in Section 5.1.
2. **Hazard category:** LTHC3 radiological
3. **Radioactive waste managed at this facility:** Routine solid contact-handled LLW and solid mixed LLW is generated and staged at this facility.
4. **RWMB documents/programs:**
 - a) Safety basis/hazard analysis:
 - EDF-7862, “Hazard Classification for the INL Research Center (IRC)”
 - b) Laboratory-wide:
 - Form 435.39, “Waste Determination and Disposition Form (WDDF)”
 - Form 435.42, “Radioactive Waste Inventory Sheet”
 - Form 441.A34, “INL Radiological Control Required Surveys”
 - LI-435, “Waste Management Routine Field Activities”
 - LRD-15001, “Radiological Control Manual”
 - LWP-13840, “Management of Issues, Observations, and Noteworthy Practices”
 - LWP-14002, “Timeout and Stop Work Authority”
 - LWP-15011, “Radioactive Material Areas and Radioactive Storage Areas”
 - LWP-17000, “Waste Management”
 - MCP-139, “Radiological Surveys”
 - MCP-17000, “Waste Generator Services Waste Management”
 - MCP-17410, “Management of Waste Storage Areas”
 - MCP-17500, “Waste Generator Services Certification of Waste Shipments to the Nevada Test Site”
 - PDD-17000, “Waste Management Program”
 - PLN-114, “INL Emergency Plan/RCRA Contingency Plan”
 - PLN-522, “Quality Assurance Program Plan for the Waste Management/Waste Certification Program”
 - c) Facility-specific:
 - 1507-08-SAF, “Determination of Ultratrace Levels of Iodine”

LLW is managed at this facility. Table 2 presents the facility compliance information for Chapter IV, “Low-level Waste Requirements.”

Table 2. IF-603, Laboratory A20, DOE Manual 435.1-1 low-level waste requirements and facility compliance information.

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
A. <u>Definition of Low-Level Waste.</u> Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2)	This requirement provides the criteria for determining which DOE radioactive waste is to be managed as LLW in accordance with DOE Manual 435.1-1, Chapter IV.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
of the <i>Atomic Energy Act of 1954</i> , as amended), or naturally occurring radioactive material. (From DOE G 435.1-1 Chapter IV: Low-level radioactive waste is defined by what it is not. The guidance on definitions in Chapters II and III should be consulted first for making a determination on how to properly manage a suspect waste stream.)	Radioactive waste managed at this facility under the requirements of this chapter is not managed under the requirements of DOE Manual 435.1-1, Chapter II or Chapter III.
B. <u>Management of Specific Wastes</u> . The following provide for management of specific wastes as low-level waste in accordance with the requirements in this Chapter:	See (1), (2), (3), (4) below.
(1) Mixed Low-Level Waste. Low-level waste determined to contain both source, special nuclear, or byproduct material subject to the <i>Atomic Energy Act of 1954</i> , as amended, and a hazardous component subject to the <i>Resource Conservation and Recovery Act</i> (RCRA), as amended, shall be managed in accordance with the requirements of RCRA and DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	This facility manages mixed LLW in satellite accumulation areas (SAAs). Management of SAAs is addressed in MCP-17410 and overall management of mixed waste is addressed in MCP-17000.
(2) TSCA-Regulated Waste. Low-level waste containing polychlorinated biphenyls, asbestos, or other such regulated toxic components shall be managed in accordance with requirements derived from the <i>Toxic Substances Control Act</i> , as amended, DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	NA; this facility does not manage TSCA-regulated waste.
(3) Accelerator-Produced Waste. Radioactive waste produced as a result of operations of DOE accelerators is low-level waste and shall be managed in accordance with DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual, and all applicable Federal or State requirements.	NA; this facility does not manage accelerator-produced waste.
(4) 11e.(2) and Naturally Occurring Radioactive Material. Small quantities of 11e.(2) byproduct material and naturally occurring radioactive material may be managed as low-level waste provided they can be managed to meet the requirements for low-level waste disposal in Section IV.P of this Manual.	NA; this facility does not manage naturally occurring radioactive material.
C. <u>Complex-Wide Low-Level Waste Management Program</u> . A complex-wide program and plan shall be developed as described under <i>Responsibilities</i> , 2.B and 2.D, in Chapter I of this Manual.	Not a facility-specific requirement. DOE Manual 435.1-1 §I.2.B and §I.2.D apply to the Assistant Secretary for Environmental Management and the Deputy Assistant Secretary for Waste Management, respectively.
D. <u>Radioactive Waste Management Basis</u> . Low-level waste facilities, operations, and activities shall have a radioactive waste management basis consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment.	The RWMB provides the regulatory framework for management of radioactive waste at INL. It specifically identifies facility management and implementing documents for the generation, storage, treatment, and disposal of radiological waste.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
The following specific waste management controls shall be part of the radioactive waste management basis:	
<p>(1) Generators. The waste certification program.</p> <p>From DOE G 435.1-1 Chapter IV: For a facility that generates low-level waste, the radioactive waste management basis is to include the program for certifying that waste meets the waste acceptance requirements of the facility(ies) to which the waste will be sent.</p>	<p>See J. below for waste certification program requirements.</p> <p>EDF-7862 establishes the laboratory facilities at the IF-603 facility as LTHC3 facilities.</p>
<p>(2) Treatment Facilities. certification program. The waste acceptance requirements and the waste [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	NA; LLW is not treated at this facility.
<p>(3) Storage Facilities. The waste acceptance requirements and the waste certification program.</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup).</p>	NA; this facility stages waste in accordance with N.(7) to facilitate treatment or disposal.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	
(4) Disposal Facilities. The performance assessment, composite analysis, disposal authorization statement, closure plan, waste acceptance requirements, and monitoring plan.	NA; this facility is not a disposal facility.
E. <u>Contingency Actions</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(5)].	DOE Manual 435.1-1 §I.1.E(5) addresses the sitewide emergency management system. The INL plan is provided in PLN-114.
<p>(1) Contingency Storage. For off-normal or emergency situations involving high activity or high hazard liquid low-level waste storage or treatment, spare capacity with adequate capabilities shall be maintained to receive the largest volume of liquid contained in any one storage tank or treatment facility. Tanks or other facilities that are designated low-level waste contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store liquid LLW.
<p>(2) Transfer Equipment. Pipelines and auxiliary facilities necessary for the transfer of high activity or high hazard liquid low-level waste to contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste</p>	NA; this facility does not store or treat liquid LLW.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.	
<p>F. <u>Corrective Actions</u>. I of this Manual. The following requirements are in addition to those in Chapter [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with DOE M 435.1-1 §I.2.G.(1) is demonstrated by records showing what corrective actions were taken to remedy situations in the radioactive waste management system.</p> <p>Compliance with DOE M 435.1-1 §I.2.G.(2) is demonstrated by having the necessary procedures, mechanisms, and training in place to effect shutdown or curtailment of activities which pose an imminent danger or other serious hazard to workers or the public, or are not protective of the environment.</p>	<p>The INL-wide procedure addressing problem identification as required by DOE Manual 435.1-1 §I.2.G.(1) is LWP-13840, which implements the laboratory's corrective action system.</p> <p>The INL-wide procedure addressing shutdown or curtailment of activities as required by DOE Manual 435.1-1 §I.2.G.(2) is LWP-14002.</p>
<p>(1) Order Compliance. Corrective actions shall be implemented whenever necessary to ensure the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual are met.</p> <p>From DOE G 435.1-1 Chapter IV: If a facility or activity can be allowed to operate while a noncompliant or hazardous condition exists, the allowance and any associated limitations must be defined as part of the facility or activity's radioactive waste management basis, identified as a configuration controlled item in a configuration management plan or included in a revision or modification to an operating procedure or similar controlled documentation.</p> <p>Compliance with this requirement is demonstrated if a corrective action system addresses noncompliant or hazardous situations involving low-level waste management facilities in a systematic fashion, and allows identification of problems by all personnel.</p>	See F. above.
<p>(2) Operations Curtailment. Operations shall be curtailed or facilities shut down for failure to establish, maintain, or operate consistent with an approved radioactive waste management basis.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated with a documented system of routine assessments to determine whether waste management activities and facilities are operating in accordance with an approved radioactive waste management basis that provides for graded limitations that can be placed on activities and operations that do not have, or are operating outside of, an approved radioactive waste management basis,</p>	The approved RWMB establishes the current compliance status at each radioactive waste management facility. Facility assessments are scheduled to ensure waste management activities are conducted in accordance with the approved RWMB.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
including shutdown of the facility.	
G. <u>Waste Acceptance</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(6)].	DOE Manual 435.1-1 §I.2.F(6) applies to field element managers.
(1) Technical and Administrative. Waste acceptance requirements for all low-level waste storage, treatment, or disposal facilities, operations, and activities shall specify, at a minimum, the following: From DOE G 435.1-1 Chapter IV: Compliance with these waste acceptance requirements is demonstrated if they are documented, contain clear and precise criteria specifying the radionuclide limits in the form of contents or concentrations that can be accepted, the limitations and prohibitions on waste forms and packages that can be received, and the limits, prohibitions, or instructions concerning any other technical information so that the waste is compatible with the safety basis of the facility, and which will result in acceptable waste at subsequent steps in managing the low-level waste.	NA; this facility does not accept LLW from other facilities.
(a) Allowable activities and/or concentrations of specific radionuclides.	See (1) above.
(b) Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal.	See (1) above.
(c) Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance.	See (1) above.
(d) The following are additional waste acceptance requirements that shall be specified in low-level waste disposal facility waste acceptance requirements:	See (1) above.
1 Low-level waste must contribute to and not detract from achieving long-term stability of the facility, minimizing the need for long-term active maintenance, minimizing subsidence, and minimizing contact of water with waste. Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical.	See (1) above.
2 Liquid low-level waste or low-level waste containing free liquid must be converted into a form that contains as little freestanding liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the waste volume when the low-level waste is in a disposal container, or 0.5 percent of the waste volume after it is	See (1) above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
processed to a stable form.	
3 Low-level waste must not be readily capable of detonation or of explosive decomposition or reaction at anticipated pressures and temperatures, or of explosive reaction with water. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.	See (1) above.
4 Low-level waste must not contain, or be capable of generating by radiolysis or biodegradation, quantities of toxic gases, vapors, or fumes harmful to the public or workers or disposal facility personnel, or harmful to the long-term structural stability of the disposal site.	See (1) above.
5 Low-level waste in a gaseous form must be packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20 C. [sic]	See (1) above.
(e) The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved. From DOE G 435.1-1 Chapter IV: Waste acceptance requirements are acceptable if they are documented and contain a clear description of the procedure and bases for obtaining an exception or deviation to the acceptance criteria for low-level waste to be received at the facility.	See (1) above.
(2) Evaluation and Acceptance. The receiving facility shall evaluate waste for acceptance, including confirmation that the technical and administrative requirements have been met. A process for the disposition of non-conforming wastes shall be established. From DOE G 435.1-1 Chapter IV: Compliance with the waste acceptance requirements for a low-level waste management facility is demonstrated if they include a process for evaluation and acceptance of incoming waste to ensure the acceptance criteria of the facility receiving the waste are met that includes one of or a combination of: (1) testing, sampling, and analysis of representative samples of waste upon receipt; (2) testing, sampling, and analysis of split samples of waste taken at the generator site; (3) evaluation of testing, sampling, and analysis of data provided by the generator, or (4) audits, reviews, surveillance, or observations of generator waste certification programs and characterization activities. Additionally, acceptable waste acceptance requirements for a storage, treatment	See (1) above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
or disposal facility will have documented procedures and actions to be taken if a waste that does not conform to the waste acceptance criteria is received at the facility.	
H. <u>Waste Generation Planning</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(7)].	DOE Manual 435.1-1 §I.2.F(7) applies to field element managers.
(1) Life-Cycle Planning. Prior to waste generation, planning shall be performed to address the entire life cycle for all low-level waste streams. From DOE G 435.1-1 Chapter IV: Compliance with this planning requirement is demonstrated by the individual sites establishing a process for evaluating the life-cycle of low-level waste prior to its generation, including the identification of low-level wastes with no path to disposal and appropriate records justifying the newly generated low-level waste stream(s), and site personnel possessing planning information showing the location(s) where low-level waste will be stored, treated, and/or disposed along with a confirmation that the personnel managing the facilities agree that the low-level waste may be managed at those facilities.	PDD-17000 and LWP-17000 provide direction to the waste generators for waste generation planning to address the entire life cycle. Form 435.39 and Form 435.42 are used for this activity.
(2) Waste with No Identified Path to Disposal. Low-level waste streams with no identified path to disposal shall be generated only in accordance with approved conditions which, at a minimum, shall address:	This facility is not generating radioactive waste that does not have an identified path to disposal.
(a) Programmatic need to generate the waste;	See (2) above.
(b) Characteristics and issues preventing the disposal of the waste;	See (2) above.
(c) Safe storage of the waste until disposal can be achieved; and	See (2) above.
(d) Activities and plans for achieving final disposal of the waste.	See (2) above.
I. <u>Waste Characterization</u> . Low-level waste shall be characterized using direct or indirect methods, and the characterization documented in sufficient detail to ensure safe management and compliance with the waste acceptance requirements of the facility receiving the waste. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program for documenting and the existence of records that document the process for acquiring and verifying the validity of low-level waste characterization data acquired through the use of direct or indirect methods.	MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information. Laboratory Instruction 1507-08-SAF, Table 2.1 provides very general characterization information regarding the waste types and volumes generated subsequent to routine laboratory operations. The table also provides the method of disposal.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(1) Data Quality Objectives. The data quality objectives process, or a comparable process, shall be used for identifying characterization parameters and acceptable uncertainty in characterization data.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the documented use of a data quality objectives or a comparable process for determining the type, quantity, and quality of characterization data needed to safely manage low-level waste.</p>	<p>Radioactive waste management facilities characterize waste in accordance with the requirements of the receiving storage, treatment, or disposal facility. The documented use of a data quality objectives process, or comparable process, was not identified for this facility.</p>
<p>(2) Minimum Waste Characterization. Characterization data shall, at a minimum, include the following information relevant to the management of the waste:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the existence of a program or procedure for determining and records that document characterization of low-level waste consistent with the minimum characterization data requirements.</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.</p> <p>Laboratory Instruction 1507-08-SAF, Table 2.1 provides very general characterization information regarding the waste types and volumes generated subsequent to routine laboratory operations. The table also provides the method of disposal.</p>
(a) Physical and chemical characteristics;	See (2) above.
(b) Volume, including the waste and any stabilization or absorbent media;	See (2) above.
(c) Weight of the container and contents;	See (2) above.
(d) Identities, activities, and concentrations of major radionuclides;	See (2) above.
(e) Characterization date;	See (2) above.
(f) Generating source; and	See (2) above.
(g) Any other information which may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives.	See (2) above.
<p>J. Waste Certification. A waste certification program shall be developed, documented, and implemented to ensure that the waste acceptance requirements of facilities receiving low-level waste for storage, treatment, and disposal are met.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the development and documentation portion of the certification requirement is demonstrated by a waste certification plan that identifies the organizations involved, assigns responsibilities for implementing the program, and describes or references the quality assurance, training, procurement controls, records management, and procedures to be used by the</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste certification information.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p> <p>Container procurement is addressed in MCP-17000 §4.6.</p> <p>Waste certification is performed and tracked using IWTS. Documentation of the IWTS Program is available electronically only.</p> <p>PLN-522 requires waste technical specialists and waste disposition specialists to complete the appropriate</p>

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>program. Acceptable performance for implementing the program is demonstrated when appropriate personnel are trained and follow the procedures that govern their part of the waste certification. Additionally, acceptable performance is demonstrated if the waste certification plan and procedures are current and controlled in accordance with a document controls program, and records related to certification (e.g., certification statements, training records, procurement records, characterization records, container records) are generated and managed in accordance with the established site program.</p>	<p>training/qualification before being granted approval authority for profiles within the IWTS Program. The waste certification official, alternate waste certification official, and NNSS packaging certifiers must complete the appropriate training/qualifications to disposition waste to NNSS.</p>
<p>(1) Certification Program. The waste certification program shall designate the officials who have the authority to certify and release waste for shipment; and specify what documentation is required for waste generation, characterization, shipment, and certification. The program shall provide requirements for auditability, retrievability, and storage of required documentation and specify the records retention period.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure for record keeping and records showing that low-level waste is certified as having met the waste acceptance criteria of the facility to which it was transferred and that the certification statement is supported by additional records regarding the waste source, characterization, and container.</p>	<p>See J. above.</p>
<p>(2) Certification before Transfer. Low-level waste shall be certified as meeting waste acceptance requirements before it is transferred to the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the presence of a certification program which includes procedures requiring a signed certification statement prior to the release of waste for transfer, and by dated records showing that waste was certified before being transferred.</p>	<p>See J. above.</p>
<p>(3) Maintaining Certification. Low-level waste that has been certified as meeting the waste acceptance requirements for transfer to a storage, treatment, or disposal facility shall be managed in a manner that maintains its certification status.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure reflecting this requirement is present and site personnel are able to show that the storage of low-level</p>	<p>See J. above.</p>

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
waste containers is in a facility or manner where the containers would not be damaged by normal weather events, and cannot be accessed by unauthorized personnel. Further, each container can be traced to its certification and the information supporting that certification.	
<p>K. <u>Waste Transfer</u>. A documented process shall be established and implemented for transferring responsibility for management of low-level waste and for ensuring availability of relevant data. The following requirements are in addition to those in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if facilities have procedures for the receipt of waste and the transfer of waste, as appropriate, which address the acquisition of waste and container data and the transfer of ownership, respectively. Further evidence of acceptable performance is facility records showing that data on the waste containers is available and accurate, and that documented transfer of responsibility occurs.</p>	<p>MCP-17000 specifies the requirements for preparing an IWTS profile that captures waste certification data, transfer information, and associated authorizations.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p>
<p>(1) Authorization. Low-level waste shall not be transferred to a storage, treatment, or disposal facility until personnel responsible for the facility receiving the waste authorize the transfer.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by sites having procedures that require a confirmation of authorization before releasing waste for transfer, and records showing that transfers are made in accordance with written authorizations.</p>	See K. above.
<p>(2) Data. Waste characterization data, container information, and generation, storage, treatment, and transportation information for low-level waste shall be transferred with or be traceable to the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if there are procedures requiring that characterization and container data be provided and maintained for each low-level waste transfer and documented records of transfers show that the information is being provided.</p>	See K. above.
L. <u>Packaging and Transportation</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(11)].	DOE Manual 435.1-1 §I.1.E(11) applies to field element managers.
<p>(1) Packaging. If containers are used:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the packaging requirement is demonstrated by: (1)</p>	MCP-17000 §4. addresses packaging requirements.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
procedures which document proper packaging protocols; and (2) no trends of routine repackaging of low-level waste that is packaged after issuance of DOE O 435.1. Successful performance of this requirement is also demonstrated by a record of containers for which failure has not routinely occurred under management conditions. It is recognized that there may be failed containers for waste previously placed in storage. For those containers, the goal is to only have to repack the waste one time after it is retrieved and characterized. Further, acceptable performance is demonstrated by containers of waste having marking and labeling that allows correlation with waste characterization data and container information.	
(a) Low-level waste shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	See (1) above.
(b) When waste is packaged, vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container.	See (1) above.
(c) Containers of low-level waste shall be marked such that their contents can be identified.	See (1) above.
(2) Transportation. To the extent practical, the volume of waste and number of low-level waste shipments shall be minimized. From DOE G 435.1-1 Chapter IV: Compliance with this requirement can be demonstrated by a combination of site procedures directing the efficient use of waste container capacity and documentation showing that low-level waste shipments are systematically planned and optimized to the extent practical.	NA; waste is not shipped from this facility to an offsite facility for final disposition.
M. <u>Site Evaluation and Facility Design</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this requirement addresses new radioactive waste management facilities.
(1) Site Evaluation. Proposed locations for low-level waste facilities shall be evaluated to identify relevant features that should be avoided or must be considered in facility design and analyses.	See M. above.
(a) Each site proposed for a new low-level waste facility or expansion of an existing low-level waste facility shall be evaluated considering environmental characteristics, geotechnical characteristics, and human activities, including for a low-level waste disposal facility, the capability of the site to demonstrate, at a	See M. above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
minimum, whether it is:	
1 Located to accommodate the projected volume of waste to be received;	See M. above.
2 Located in a flood plain, a tectonically active area, or in the zone of water table fluctuation; and	See M. above.
3 Located where radionuclide migration pathways are predictable and erosion and surface runoff can be controlled.	See M. above.
(b) Proposed sites with environmental characteristics, geotechnical characteristics, and human activities for which adequate protection cannot be provided through facility design shall be deemed unsuitable for the location of the facility.	See M. above.
(c) Low-level waste disposal facilities shall be sited to achieve long-term stability and to minimize, to the extent practical, the need for active maintenance following final closure.	See M. above.
(2) Low-Level Waste Treatment and Storage Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	See M. above.
1 Design of low-level waste treatment and storage facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a non-flammable and nonexplosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Consideration of Decontamination and Decommissioning. Areas in new and modifications to existing low-level waste management facilities that are subject to contamination with radioactive or other hazardous materials shall be designed to facilitate decontamination. For such facilities a proposed decommissioning method or a conversion method	See M. above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
leading to reuse shall be described.	
(d) Instrumentation and Control Systems. Engineering controls shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide volume inventory data and to prevent spills, leaks, and overflows from tanks or confinement systems.	See M. above.
(e) Monitoring. Monitoring and/or leak detection capabilities shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide rapid identification of failed confinement and/or other abnormal conditions.	See M. above.
(3) Low-Level Waste Disposal Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	
1 Design of low-level waste disposal facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a nonflammable and non-explosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Stability. Low-level waste disposal facilities shall be designed to achieve long-term stability and to minimize to the extent practical, the need for active maintenance following final closure.	See M. above.
(d) Control of Water. Low-level waste disposal facilities shall be designed to minimize to the extent practical, the contact of waste with water during and after disposal.	See M. above.
N. <u>Storage and Staging</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(13)].	DOE Manual 435.1-1 §I.2.F(13) applies to field element managers.
(1) Storage Prohibitions. Low-level waste in storage	NA; this facility does not store LLW.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water. Prior to storage, pyrophoric materials shall be treated, prepared, and packaged to be nonflammable.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by having waste acceptance requirements which prohibit low-level waste that is ignitable or explosive from being accepted for storage unless it has been treated, and procedures for properly preparing such materials for safe storage.</p>	
<p>(2) Storage Limit. Low-level waste that has an identified path to disposal shall not be stored longer than one year prior to disposal, except for storage for decay, or as otherwise authorized by the Field Element Manager.</p> <p>From DOE G 435.1-1 Chapter IV: Storage longer than one year can be justified if the conditions for such storage are approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Storage for radioactive decay for a period greater than 1 year for waste that has an identified path to disposal is allowed. Adequate justification and the supporting information for storage for decay is to be documented in the radioactive waste management basis for the facility in which the storage will take place.</p> <p><u>Mixed waste.</u> Under the Federal Facility Compliance Act of 1992, DOE sites were required to develop Site Treatment Plans to bring stored mixed low-level waste into compliance with these requirements. The Site Treatment Plan needs to be consulted and any mixed low-level waste stored for the purpose of accumulation to facilitate treatment must meet Resource Conservation and Recovery Act storage requirements. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement and include appropriate provisions in the radioactive waste management basis for the facility in which it is stored.</p> <p><u>Legacy waste.</u> As discussed above, the intention of the requirement is not to force malicious compliance or heroic actions which would result in increased risk or safety concerns. Rather, the intention is that waste in storage longer than one year receives additional attention to ensure that the public, the workers, and the environment are protected from the hazards of the</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>waste, and that progress is being made to dispose of the waste. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement:</p> <p>1) the radioactive waste management basis allows for storage for no more than one year.</p> <p>2) the radioactive waste management basis allows for storage for no more than one year, or for storage for decay only for periods greater than a year, which are specified on a radionuclide basis.</p> <p>3) the radioactive waste management basis allows for storage for more than one year, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>4) the radioactive waste management basis allows for storage for decay (with specifics) and for storage for more than one year for other low-level waste, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>Compliance with this requirement is demonstrated by the existence of a radioactive waste management basis for the storage facility approved by the Field Element Manager that includes the time frames that waste are allowed to be stored, the necessary justifications for storage for decay, and the necessary technical evaluations if storage is to extend significantly beyond the one-year time frame.</p>	
<p>(3) Storage Integrity. Low-level waste shall be stored in a location and manner that protects the integrity of waste for the expected time of storage and minimizes worker exposure.</p> <p>From DOE G 435.1-1 Chapter IV: However, in making a decision to use a facility for storage and in developing a radioactive waste management basis for the activity, particular attention to protection of workers is needed.</p> <p>Compliance with this requirement is demonstrated if</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
sites have storage capabilities for low-level waste that provide protection to waste containers so that their integrity will not be damaged through physical or chemical (corrosion) processes and that keep personnel from spending extended periods of time in the areas where low-level waste is stored.	
(4) Waste Characterization for Storage.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(a) Low-level waste that does not have an identified path to disposal shall be characterized as necessary to meet the data quality objectives and minimum characterization requirements of this Chapter, to ensure safe storage, and to facilitate disposal.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(b) Characterization information for all low-level waste in storage shall be maintained as a record in accordance with the requirements for Records Management in Chapter I of this Manual. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by documented procedures for managing waste characterization and container information on low-level waste as a Federal record. The records are managed per the applicable policies and procedures for records management referenced in DOE O 200.1 and established at the applicable Field Element.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(5) Container Inspection. A process shall be developed and implemented for inspecting and maintaining containers of low-level waste to ensure container integrity is not compromised. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by: (1) a documented process for waste container inspection and maintenance; and (2) documentation for all waste container inspections and maintenance actions performed.	LI-435 requires quarterly inspections of radioactive waste containers if waste is stored outdoors or has been in storage for greater than 1 year.
(6) Storage Management. Low-level waste storage shall be managed to identify and segregate low-level waste from mixed low-level waste.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(7) Staging. Staging of low-level waste shall be for the purpose of the accumulation of such quantities of waste as necessary to facilitate transportation, treatment, and disposal. Staging longer than 90 days shall meet the requirements for storage above and in Chapter I of this Manual. From DOE G 435.1-1 Chapter IV: The staging of low-level waste needs to be addressed in the radioactive waste management basis for the facility that is	Routine LLW, such as personnel protective equipment, is accumulated at this facility for disposal. MCP-17000, Appendix F, "Container Start Date and Storage Prohibitions," restricts staging LLW to 90 days maximum at any generator or treatment facility prior to acceptance by a storage facility. As stated in DOE Guide 435.1-1 §IV.N.(7), staging waste in accordance with this requirement allows waste to be accumulated without being considered storage

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>performing the staging. Generators, treatment facilities, and disposal facilities that stage waste must ensure that the action of staging is included and authorized as part of their radioactive waste management basis for the affected facilities, operations, or activities.</p> <p>Staging longer than 90 days must be justified, the conditions for such storage met, and these practices approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Compliance with this requirement is demonstrated by a staging program that limits the temporary storage of waste to only circumstances allowed in the requirement, including justifications for any staging that exceeds the 90-day period, which is documented in the radioactive waste management basis for the facility.</p>	and being bound by the associated storage requirements.
<p>O. <u>Treatment</u>. Low-level waste treatment to provide more stable waste forms and to improve the long-term performance of a low-level waste disposal facility shall be implemented as necessary to meet the performance objectives of the disposal facility.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated when a treatment facility or process ensures that treated waste will meet the minimum waste form requirements of DOE M 435.1 and meet additional disposal facility-specific waste acceptance requirements for additional stability or long-term performance of facilities that will receive the treated waste.</p>	NA; this facility does not treat LLW.
<p>P. <u>Disposal</u>. Low-level waste disposal facilities shall meet the following requirements.</p>	NA; this facility does not dispose of LLW.
<p>(1) Performance Objectives. Low-level waste disposal facilities shall be sited, designed, operated, maintained, and closed so that a reasonable expectation exists that the following performance objectives will be met for waste disposed of after September 26, 1988:</p>	See P. above.
<p>(a) Dose to representative members of the public shall not exceed 25 mrem (0.25 mSv) in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air.</p>	See P. above.
<p>(b) Dose to representative members of the public via the air pathway shall not exceed 10 mrem (0.10 mSv) in a year total effective dose equivalent, excluding the dose from radon and its progeny.</p>	See P. above.
<p>(c) Release of radon shall be less than an average flux of 20 pCi/m²/s (0.74Bq/m²/s) at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/l (0.0185 Bq/l) of air may be applied at the boundary of</p>	See P. above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
the facility.	
(2) Performance Assessment. A site-specific radiological performance assessment shall be prepared and maintained for DOE low-level waste disposed of after September 26, 1988. The performance assessment shall include calculations for a 1,000 year period after closure of potential doses to representative future members of the public and potential releases from the facility to provide a reasonable expectation that the performance objectives identified in this Chapter are not exceeded as a result of operation and closure of the facility.	See P. above.
(a) Analyses performed to demonstrate compliance with the performance objectives in this Chapter, and to establish limits on concentrations of radionuclides for disposal based on the performance measures for inadvertent intruders in this Chapter shall be based on reasonable activities in the critical group of exposed individuals. Unless otherwise specified, the assumption of average living habits and exposure conditions in representative critical groups of individuals projected to receive the highest doses is appropriate. The likelihood of inadvertent intruder scenarios may be considered in interpreting the results of the analyses and establishing radionuclide concentrations, if adequate justification is provided.	See P. above.
(b) The point of compliance shall correspond to the point of highest projected dose or concentration beyond a 100 meter buffer zone surrounding the disposed waste. A larger or smaller buffer zone may be used if adequate justification is provided.	See P. above.
(c) Performance assessments shall address reasonably foreseeable natural processes that might disrupt barriers against release and transport of radioactive materials.	See P. above.
(d) Performance assessments shall use DOE-approved dose coefficients (dose conversion factors) for internal and external exposure of reference adults.	See P. above.
(e) The performance assessment shall include a sensitivity/uncertainty analysis.	See P. above.
(f) Performance assessments shall include a demonstration that projected releases of radionuclides to the environment shall be maintained as low as reasonably achievable (ALARA).	See P. above.
(g) For purposes of establishing limits on radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts to water resources.	See P. above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
(h) For purposes of establishing limits on the concentration of radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts calculated for a hypothetical person assumed to inadvertently intrude for a temporary period into the low-level waste disposal facility. For intruder analyses, institutional controls shall be assumed to be effective in deterring intrusion for at least 100 years following closure. The intruder analyses shall use performance measures for chronic and acute exposure scenarios, respectively, of 100 mrem (1 mSv) in a year and 500 mrem (5 mSv) total effective dose equivalent excluding radon in air.	See P. above.
(3) Composite Analysis. For disposal facilities which received waste after September 26, 1988, a site-specific radiological composite analysis shall be prepared and maintained that accounts for all sources of radioactive material that may be left at the DOE site and may interact with the low-level waste disposal facility, contributing to the dose projected to a hypothetical member of the public from the existing or future disposal facilities. Performance measures shall be consistent with DOE requirements for protection of the public and environment and evaluated for a 1,000 year period following disposal facility closure. The composite analysis results shall be used for planning, radiation protection activities, and future use commitments to minimize the likelihood that current low-level waste disposal activities will result in the need for future corrective or remedial actions to adequately protect the public and the environment.	See P. above.
(4) Performance Assessment and Composite Analysis Maintenance. The performance assessment and composite analysis shall be maintained to evaluate changes that could affect the performance, design, and operating bases for the facility. Performance assessment and composite analysis maintenance shall include the conduct of research, field studies, and monitoring needed to address uncertainties or gaps in existing data. The performance assessment shall be updated to support the final facility closure. Additional iterations of the performance assessment and composite analysis shall be conducted as necessary during the post-closure period.	See P. above.
(a) Performance assessments and composite analyses shall be reviewed and revised when changes in waste forms or containers, radionuclide inventories, facility design and operations, closure concepts, or the improved understanding of the performance of the	See P. above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
waste disposal facility in combination with the features of the site on which it is located alter the conclusions or the conceptual model(s) of the existing performance assessment or composite analysis.	
(b) A determination of the continued adequacy of the performance assessment and composite analysis shall be made on an annual basis, and shall consider the results of data collection and analysis from research, field studies, and monitoring.	See P. above.
(c) Annual summaries of low-level waste disposal operations shall be prepared with respect to the conclusions and recommendations of the performance assessment and composite analysis and a determination of the need to revise the performance assessment or composite analysis.	See P. above.
(5) Disposal Authorization. A disposal authorization statement shall be obtained prior to construction of a new low-level waste disposal facility. Field Elements with existing low-level waste disposal facilities shall obtain a disposal authorization statement in accordance with the schedule in the Complex-Wide Low-Level Waste Management Program Plan. The disposal authorization statement shall be issued based on a review of the facility's performance assessment, composite analysis, performance assessment and composite analysis maintenance, preliminary closure plan, and preliminary monitoring plan. The disposal authorization statement shall specify the limits and conditions on construction, design, operations, and closure of the low-level waste facility based on these reviews. A disposal authorization statement is a part of the radioactive waste management basis for a disposal facility. Failure to obtain a disposal authorization statement by the implementation date of this Order shall result in shutdown of the disposal facility.	See P. above.
(6) Disposal Facility Operations. The disposal facility design and operation must be consistent with the disposal facility closure plan and lead to disposal facility closure that provides a reasonable expectation that performance objectives will be met. Low-level waste shall be disposed in such a manner that achieves the performance objectives stated in this Chapter, consistent with the disposal facility radiological performance assessment. Additional requirements include:	See P. above.
(a) Operating procedures shall be developed and implemented for low-level waste disposal facilities that protect the public, workers, and the environment; ensure the security of the facility; minimize subsidence	See P. above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
during and after waste emplacement; achieve long-term stability and minimize the need for long-term active maintenance; and meet the requirements of the closure/post-closure plan.	
(b) Permanent identification markers for disposal excavations and monitoring wells shall be emplaced.	See P. above.
(c) Low-level waste placement into disposal units shall minimize voids between waste containers. Voids within disposal units shall be filled to the extent practical. Uncontainerized bulk waste shall also be placed in a manner that minimizes voids and subsidence.	
(d) Operations are to be conducted so that active waste disposal operations will not have an adverse effect on any other disposal units.	See P. above.
(e) Operations shall include a process for tracking and documenting low-level waste placement in the facility by generator source.	See P. above.
(7) Alternate Requirements for Low-Level Waste Disposal Facility Design and Operation. Requirements other than those set forth in this Section for the design and operation of a low-level waste disposal facility may be approved on a specific basis if a reasonable expectation is demonstrated that the disposal performance objectives will be met.	See P. above.
Q. <u>Closure</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this facility does not dispose of LLW.
(1) Disposal Facility Closure Plans. A preliminary closure plan shall be developed and submitted to Headquarters for review with the performance assessment and composite analysis. The closure plan shall be updated following issuance of the disposal authorization statement to incorporate conditions specified in the disposal authorization statement. Closure plans shall:	See Q. above.
(a) Be updated as required during the operational life of the facility.	See Q. above.
(b) Include a description of how the disposal facility will be closed to achieve long-term stability and minimize the need for active maintenance following closure and to ensure compliance with the requirements of DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(c) Include the total expected inventory of wastes to be disposed of at the facility over the operational life of the facility.	See Q. above.

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
(2) Disposal Facility Closure. Closure of a disposal facility shall occur within a five-year period after it is filled to capacity, or after the facility is otherwise determined to be no longer needed.	See Q. above.
(a) Prior to facility closure, the final inventory of the low-level waste disposed in the facility shall be prepared and incorporated in the performance assessment and composite analysis which shall be updated to support the closure of the facility.	See Q. above.
(b) A final closure plan shall be prepared based on the final inventory of waste disposed in the facility, the plan implemented, and the updated performance assessment and composite analysis prepared in support of the facility closure.	See Q. above.
(c) Institutional control measures shall be integrated into land use and stewardship plans and programs, and shall continue until the facility can be released pursuant to DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(d) The location and use of the facility shall be filed with the local authorities responsible for land use and zoning.	See Q. above.
R. <u>Monitoring</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(7)].	DOE Manual 435.1-1 §I.1.E(7) applies to field element managers.
<p>(1) All Waste Facilities. Parameters that shall be sampled or monitored, at a minimum, include: temperature, pressure (for closed systems), radioactivity in ventilation exhaust and liquid effluent streams, and flammable or explosive mixtures of gases. Facility monitoring programs shall include verification that passive and active control systems have not failed.</p> <p>From DOE G 435.1-1 Chapter IV: The minimum parameters specified in the requirement were selected based on their potential significance for anticipating and identifying undesirable conditions at low-level waste management facilities. Each facility's radioactive waste management basis should include an evaluation of the applicability and significance of the minimum parameters. This evaluation also needs to consider additional parameters to be sampled or monitored to ensure the protection of the public health, the environment, and the workers. If a minimum parameter specified in the requirement is deemed to be not applicable in any way to the active operation of that facility, then that justification should be included in the radioactive waste management basis and when</p>	<p>Monitoring requirements at INL radioactive waste management facilities are tailored for the specific facility to enable timely indication of developing problems. Existing radiological control procedures and assessments are followed/completed to monitor waste facilities.</p> <p>LRD-15001 and MCP-139 specify methods and frequency of radiological control surveys of all radiological areas. MCP-139 specifies the use of Form 441.A34. This form is referred to as the "routine sheet" and is to be used by facility radiological control foremen to list radiological areas that are to be surveyed, the survey periods, and methods.</p>

Table 2. (continued).

Facility Name: IF-603, Laboratory A20	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>approved constitutes an exemption to the manual.</p> <p>Verification activities are part of the radioactive waste management basis as a condition for operation and documented appropriately.</p> <p>Compliance with this requirement is demonstrated if monitoring or sampling for the stated parameters is performed for all facilities with a precision, accuracy, and frequency consistent with timely identification of developing problems and a justification exists in the approved radioactive waste management basis for those specified parameters which are not monitored or sampled.</p>	
(2) Liquid Waste Storage Facilities. For facilities storing liquid low-level waste, the following shall also be monitored: liquid level and/or waste volume, and significant waste chemistry parameters.	NA; liquid LLW is not stored in this facility.
(3) Disposal Facilities. A preliminary monitoring plan for a low-level waste disposal facility shall be prepared and submitted to Headquarters for review with the performance assessment and composite analysis. The monitoring plan shall be updated within one year following issuance of the disposal authorization statement to incorporate and implement conditions specified in the disposal authorization statement.	NA; this facility does not dispose of LLW.
(a) The site-specific performance assessment and composite analysis shall be used to determine the media, locations, radionuclides, and other substances to be monitored.	See (3) above.
(b) The environmental monitoring program shall be designed to include measuring and evaluating releases, migration of radionuclides, disposal unit subsidence, and changes in disposal facility and disposal site parameters which may affect long-term performance.	See (3) above.
(c) The environmental monitoring programs shall be capable of detecting changing trends in performance to allow application of any necessary corrective action prior to exceeding the performance objectives in this Chapter.	See (3) above.

4.3 IF-603, Laboratory C19

1. **Facility description:** See the IF-603 facility description provided in Section 5.1.
2. **Hazard category:** LTHC3 radiological
3. **Radioactive waste management activities at this facility:** Routine contact-handled LLW and mixed LLW is generated and staged at this facility.
4. **RWMB documents/programs:**

- a) Safety basis/hazards analysis:
 - EDF-7862, “Hazard Classification for the INL Research Center (IRC)”
- b) Laboratory-wide:
 - Form 435.39, “Waste Determination and Disposition Form (WDDF)”
 - Form 435.42, “Radioactive Waste Inventory Sheet”
 - Form 441.A34, “INL Radiological Control Required Surveys”
 - LI-435, “Waste Management Routine Field Activities”
 - LRD-15001, “Radiological Control Manual”
 - LWP-13840, “Management of Issues, Observations, and Noteworthy Practices”
 - LWP-14002, “Timeout and Stop Work Authority”
 - LWP-15011, “Radioactive Material Areas and Radioactive Storage Areas”
 - LWP-17000, “Waste Management”
 - MCP-139, “Radiological Surveys”
 - MCP-17000, “Waste Generator Services Waste Management”
 - MCP-17410, “Management of Waste Storage Areas”
 - MCP-17500, “Waste Generator Services Certification of Waste Shipments to the Nevada Test Site”
 - PDD-17000, “Waste Management Program”
 - PLN-114, “INL Emergency Plan/RCRA Contingency Plan
 - PLN-522, “Quality Assurance Program Plan for the Waste Management/Waste Certification Program”
- c) Facility-specific:
 - LI 1577-09-IRC, “Irradiated Graphite Characterization Laboratory Instructions”

LLW is managed at this facility. Table 3 presents the facility compliance information for Chapter IV, “Low-level Waste Requirements.”

Table 3. IF-603, Laboratory C19, DOE Manual 435.1-1 low-level waste requirements and facility compliance information.

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>A. <u>Definition of Low-Level Waste.</u> Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the <i>Atomic Energy Act of 1954</i>, as amended), or naturally occurring radioactive material.</p> <p>(From DOE G 435.1-1 Chapter IV: Low-level radioactive waste is defined by what it is not. The guidance on definitions in Chapters II and III should be consulted first for making a determination on how to properly manage a suspect waste stream.)</p>	<p>This requirement provides the criteria for determining which DOE radioactive waste is to be managed as LLW in accordance with DOE Manual 435.1-1, Chapter IV.</p> <p>Radioactive waste managed at this facility under the requirements of this chapter is not managed under the requirements of DOE Manual 435.1-1, Chapter II or Chapter III.</p>
<p>B. <u>Management of Specific Wastes.</u> The following provide for management of specific wastes as low-level</p>	<p>See (1), (2), (3), (4) below.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
waste in accordance with the requirements in this Chapter:	
(1) Mixed Low-Level Waste. Low-level waste determined to contain both source, special nuclear, or byproduct material subject to the <i>Atomic Energy Act of 1954</i> , as amended, and a hazardous component subject to the <i>Resource Conservation and Recovery Act</i> (RCRA), as amended, shall be managed in accordance with the requirements of RCRA and DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	This facility manages mixed LLW in SAAs. Management of SAAs is addressed in MCP-17410 and overall management of mixed waste is addressed in MCP-17000.
(2) TSCA-Regulated Waste. Low-level waste containing polychlorinated biphenyls, asbestos, or other such regulated toxic components shall be managed in accordance with requirements derived from the <i>Toxic Substances Control Act</i> , as amended, DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	NA; this facility does not manage TSCA-regulated waste.
(3) Accelerator-Produced Waste. Radioactive waste produced as a result of operations of DOE accelerators is low-level waste and shall be managed in accordance with DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual, and all applicable Federal or State requirements.	NA; this facility does not manage accelerator-produced waste.
(4) 11e.(2) and Naturally Occurring Radioactive Material. Small quantities of 11e.(2) byproduct material and naturally occurring radioactive material may be managed as low-level waste provided they can be managed to meet the requirements for low-level waste disposal in Section IV.P of this Manual.	NA; this facility does not manage naturally occurring radioactive material.
C. <u>Complex-Wide Low-Level Waste Management Program</u> . A complex-wide program and plan shall be developed as described under <i>Responsibilities</i> , 2.B and 2.D, in Chapter I of this Manual.	Not a facility-specific requirement. DOE Manual 435.1-1 §1.2.B and §1.2.D apply to the Assistant Secretary for Environmental Management and the Deputy Assistant Secretary for Waste Management, respectively.
D. <u>Radioactive Waste Management Basis</u> . Low-level waste facilities, operations, and activities shall have a radioactive waste management basis consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment. The following specific waste management controls shall be part of the radioactive waste management basis:	The RWMB provides the regulatory framework for management of radioactive waste at INL. It specifically identifies facility management and implementing documents for the generation, storage, treatment, and disposal of radiological waste.
(1) Generators. The waste certification program. From DOE G 435.1-1 Chapter IV: For a facility that generates low-level waste, the radioactive waste management basis is to include the program for certifying that waste meets the waste acceptance requirements of the facility(ies) to which the waste will	See J. below for waste certification program requirements. EDF-7862 establishes the laboratory facilities at the IF-603 facility as LTHC3 facilities.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
be sent.	
<p>(2) Treatment Facilities. certification program. The waste acceptance requirements and the waste [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	NA; waste is not treated at this facility.
<p>(3) Storage Facilities. The waste acceptance requirements and the waste certification program.</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	NA; this facility stages waste in accordance with N.(7) to facilitate treatment or disposal.
<p>(4) Disposal Facilities. The performance assessment,</p>	NA; this facility is not a disposal facility.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
composite analysis, disposal authorization statement, closure plan, waste acceptance requirements, and monitoring plan.	
E. <u>Contingency Actions</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(5)].	DOE Manual 435.1-1 §I.1.E(5) addresses the sitewide emergency management system. The INL plan is provided in PLN-114.
<p>(1) Contingency Storage. For off-normal or emergency situations involving high activity or high hazard liquid low-level waste storage or treatment, spare capacity with adequate capabilities shall be maintained to receive the largest volume of liquid contained in any one storage tank or treatment facility. Tanks or other facilities that are designated low-level waste contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store liquid LLW.
<p>(2) Transfer Equipment. Pipelines and auxiliary facilities necessary for the transfer of high activity or high hazard liquid low-level waste to contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store or treat liquid LLW.
<p>F. <u>Corrective Actions</u>. I of this Manual. The following requirements are in addition to those in Chapter [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with DOE M 435.1-1 §I.2.G.(1) is demonstrated by records</p>	The INL-wide procedure addressing problem identification as required by DOE Manual 435.1-1 §I.2.G.(1) is LWP-13840, which implements the laboratory's corrective action system.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>showing what corrective actions were taken to remedy situations in the radioactive waste management system.</p> <p>Compliance with DOE M 435.1-1 §I.2.G.(2) is demonstrated by having the necessary procedures, mechanisms, and training in place to effect shutdown or curtailment of activities which pose an imminent danger or other serious hazard to workers or the public, or are not protective of the environment.</p>	<p>The INL-wide procedure addressing shutdown or curtailment of activities as required by DOE Manual 435.1-1 §I.2.G.(2) is LWP-14002.</p>
<p>(1) Order Compliance. Corrective actions shall be implemented whenever necessary to ensure the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual are met.</p> <p>From DOE G 435.1-1 Chapter IV: If a facility or activity can be allowed to operate while a noncompliant or hazardous condition exists, the allowance and any associated limitations must be defined as part of the facility or activity's radioactive waste management basis, identified as a configuration controlled item in a configuration management plan or included in a revision or modification to an operating procedure or similar controlled documentation.</p> <p>Compliance with this requirement is demonstrated if a corrective action system addresses noncompliant or hazardous situations involving low-level waste management facilities in a systematic fashion, and allows identification of problems by all personnel.</p>	<p>See F. above.</p>
<p>(2) Operations Curtailment. Operations shall be curtailed or facilities shut down for failure to establish, maintain, or operate consistent with an approved radioactive waste management basis.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated with a documented system of routine assessments to determine whether waste management activities and facilities are operating in accordance with an approved radioactive waste management basis that provides for graded limitations that can be placed on activities and operations that do not have, or are operating outside of, an approved radioactive waste management basis, including shutdown of the facility.</p>	<p>The approved RWMB establishes the current compliance status at each radioactive waste management facility. Facility assessments are scheduled to ensure waste management activities are conducted in accordance with the approved RWMB.</p>
<p>G. <u>Waste Acceptance</u>. The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(6)].</p>	<p>DOE Manual 435.1-1 §I.2.F(6) applies to field element managers.</p>
<p>(1) Technical and Administrative. Waste acceptance requirements for all low-level waste storage, treatment, or disposal facilities, operations, and activities shall specify, at a minimum, the following:</p>	<p>NA; this facility does not accept LLW from other facilities.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
From DOE G 435.1-1 Chapter IV: Compliance with these waste acceptance requirements is demonstrated if they are documented, contain clear and precise criteria specifying the radionuclide limits in the form of contents or concentrations that can be accepted, the limitations and prohibitions on waste forms and packages that can be received, and the limits, prohibitions, or instructions concerning any other technical information so that the waste is compatible with the safety basis of the facility, and which will result in acceptable waste at subsequent steps in managing the low-level waste.	
(a) Allowable activities and/or concentrations of specific radionuclides.	See (1) above.
(b) Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal.	See (1) above.
(c) Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance.	See (1) above.
(d) The following are additional waste acceptance requirements that shall be specified in low-level waste disposal facility waste acceptance requirements:	See (1) above.
1 Low-level waste must contribute to and not detract from achieving long-term stability of the facility, minimizing the need for long-term active maintenance, minimizing subsidence, and minimizing contact of water with waste. Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical.	See (1) above.
2 Liquid low-level waste or low-level waste containing free liquid must be converted into a form that contains as little freestanding liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the waste volume when the low-level waste is in a disposal container, or 0.5 percent of the waste volume after it is processed to a stable form.	See (1) above.
3 Low-level waste must not be readily capable of detonation or of explosive decomposition or reaction at anticipated pressures and temperatures, or of explosive reaction with water. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.	See (1) above.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
4 Low-level waste must not contain, or be capable of generating by radiolysis or biodegradation, quantities of toxic gases, vapors, or fumes harmful to the public or workers or disposal facility personnel, or harmful to the long-term structural stability of the disposal site.	See (1) above.
5 Low-level waste in a gaseous form must be packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20 C. [sic]	See (1) above.
<p>(e) The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.</p> <p>From DOE G 435.1-1 Chapter IV: Waste acceptance requirements are acceptable if they are documented and contain a clear description of the procedure and bases for obtaining an exception or deviation to the acceptance criteria for low-level waste to be received at the facility.</p>	See (1) above.
<p>(2) Evaluation and Acceptance. The receiving facility shall evaluate waste for acceptance, including confirmation that the technical and administrative requirements have been met. A process for the disposition of non-conforming wastes shall be established.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the waste acceptance requirements for a low-level waste management facility is demonstrated if they include a process for evaluation and acceptance of incoming waste to ensure the acceptance criteria of the facility receiving the waste are met that includes one of or a combination of: (1) testing, sampling, and analysis of representative samples of waste upon receipt; (2) testing, sampling, and analysis of split samples of waste taken at the generator site; (3) evaluation of testing, sampling, and analysis of data provided by the generator, or (4) audits, reviews, surveillance, or observations of generator waste certification programs and characterization activities. Additionally, acceptable waste acceptance requirements for a storage, treatment or disposal facility will have documented procedures and actions to be taken if a waste that does not conform to the waste acceptance criteria is received at the facility.</p>	See (1) above.
H. <u>Waste Generation Planning</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(7)].	DOE Manual 435.1-1 §I.2.F(7) applies to field element managers.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(1) Life-Cycle Planning. Prior to waste generation, planning shall be performed to address the entire life cycle for all low-level waste streams.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this planning requirement is demonstrated by the individual sites establishing a process for evaluating the life-cycle of low-level waste prior to its generation, including the identification of low-level wastes with no path to disposal and appropriate records justifying the newly generated low-level waste stream(s), and site personnel possessing planning information showing the location(s) where low-level waste will be stored, treated, and/or disposed along with a confirmation that the personnel managing the facilities agree that the low-level waste may be managed at those facilities.</p>	<p>PDD-17000 and LWP-17000 provide direction to the waste generators for waste generation planning to address the entire life cycle.</p> <p>Form 435.39 and Form 435.42 are used for this activity.</p>
<p>(2) Waste with No Identified Path to Disposal. Low-level waste streams with no identified path to disposal shall be generated only in accordance with approved conditions which, at a minimum, shall address:</p>	<p>This facility is not generating radioactive waste that does not have an identified path to disposal.</p>
<p>(a) Programmatic need to generate the waste;</p>	<p>See (2) above.</p>
<p>(b) Characteristics and issues preventing the disposal of the waste;</p>	<p>See (2) above.</p>
<p>(c) Safe storage of the waste until disposal can be achieved; and</p>	<p>See (2) above.</p>
<p>(d) Activities and plans for achieving final disposal of the waste.</p>	<p>See (2) above.</p>
<p>I. <u>Waste Characterization</u>. Low-level waste shall be characterized using direct or indirect methods, and the characterization documented in sufficient detail to ensure safe management and compliance with the waste acceptance requirements of the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program for documenting and the existence of records that document the process for acquiring and verifying the validity of low-level waste characterization data acquired through the use of direct or indirect methods.</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.</p> <p>Laboratory Instruction 1577-09-IRC, Table 2.03 provides very general characterization information regarding the waste types and volumes generated subsequent to routine laboratory operations. The table also provides the method of disposal.</p>
<p>(1) Data Quality Objectives. The data quality objectives process, or a comparable process, shall be used for identifying characterization parameters and acceptable uncertainty in characterization data.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the documented use of a data quality objectives or a comparable process for</p>	<p>Radioactive waste management facilities characterize waste in accordance with the requirements of the receiving storage, treatment, or disposal facility. The documented use of a data quality objectives process, or comparable process, was not identified for this facility.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
determining the type, quantity, and quality of characterization data needed to safely manage low-level waste.	
<p>(2) Minimum Waste Characterization. Characterization data shall, at a minimum, include the following information relevant to the management of the waste:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the existence of a program or procedure for determining and records that document characterization of low-level waste consistent with the minimum characterization data requirements.</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.</p> <p>LI-1577-09-IRC, Table 2.03 provides very general characterization information regarding the waste types and volumes generated subsequent to routine laboratory operations. The table also provides the method of disposal.</p>
(a) Physical and chemical characteristics;	See (2) above.
(b) Volume, including the waste and any stabilization or absorbent media;	See (2) above.
(c) Weight of the container and contents;	See (2) above.
(d) Identities, activities, and concentrations of major radionuclides;	See (2) above.
(e) Characterization date;	See (2) above.
(f) Generating source; and	See (2) above.
(g) Any other information which may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives.	See (2) above.
<p>J. <u>Waste Certification</u>. A waste certification program shall be developed, documented, and implemented to ensure that the waste acceptance requirements of facilities receiving low-level waste for storage, treatment, and disposal are met.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the development and documentation portion of the certification requirement is demonstrated by a waste certification plan that identifies the organizations involved, assigns responsibilities for implementing the program, and describes or references the quality assurance, training, procurement controls, records management, and procedures to be used by the program. Acceptable performance for implementing the program is demonstrated when appropriate personnel are trained and follow the procedures that govern their part of the waste certification. Additionally, acceptable performance is demonstrated if the waste certification plan and procedures are current and controlled in accordance with a document controls program, and records related to certification (e.g., certification statements, training records, procurement records,</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste certification information.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p> <p>Container procurement is addressed in MCP-17000 §4.6.</p> <p>Waste certification is performed and tracked using IWTS. Documentation of the IWTS Program is available electronically only.</p> <p>PLN-522 requires waste technical specialists and waste disposition specialists to complete the appropriate training/qualification before being granted approval authority for profiles within the IWTS Program. The waste certification official, waste certification official, and NNSS packaging certifiers must complete the appropriate training/qualifications to disposition waste to NNSS.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
characterization records, container records) are generated and managed in accordance with the established site program.	
<p>(1) Certification Program. The waste certification program shall designate the officials who have the authority to certify and release waste for shipment; and specify what documentation is required for waste generation, characterization, shipment, and certification. The program shall provide requirements for auditability, retrievability, and storage of required documentation and specify the records retention period.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure for record keeping and records showing that low-level waste is certified as having met the waste acceptance criteria of the facility to which it was transferred and that the certification statement is supported by additional records regarding the waste source, characterization, and container.</p>	See J. above.
<p>(2) Certification before Transfer. Low-level waste shall be certified as meeting waste acceptance requirements before it is transferred to the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the presence of a certification program which includes procedures requiring a signed certification statement prior to the release of waste for transfer, and by dated records showing that waste was certified before being transferred.</p>	See J. above.
<p>(3) Maintaining Certification. Low-level waste that has been certified as meeting the waste acceptance requirements for transfer to a storage, treatment, or disposal facility shall be managed in a manner that maintains its certification status.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure reflecting this requirement is present and site personnel are able to show that the storage of low-level waste containers is in a facility or manner where the containers would not be damaged by normal weather events, and cannot be accessed by unauthorized personnel. Further, each container can be traced to its certification and the information supporting that certification.</p>	See J. above.
K. <u>Waste Transfer</u> . A documented process shall be established and implemented for transferring responsibility for management of low-level waste and	MCP-17000 specifies the requirements for preparing an IWTS profile that captures waste certification data, transfer information, and associated authorizations.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>for ensuring availability of relevant data. The following requirements are in addition to those in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if facilities have procedures for the receipt of waste and the transfer of waste, as appropriate, which address the acquisition of waste and container data and the transfer of ownership, respectively. Further evidence of acceptable performance is facility records showing that data on the waste containers is available and accurate, and that documented transfer of responsibility occurs.</p>	<p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p>
<p>(1) Authorization. Low-level waste shall not be transferred to a storage, treatment, or disposal facility until personnel responsible for the facility receiving the waste authorize the transfer.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by sites having procedures that require a confirmation of authorization before releasing waste for transfer, and records showing that transfers are made in accordance with written authorizations.</p>	<p>See K. above.</p>
<p>(2) Data. Waste characterization data, container information, and generation, storage, treatment, and transportation information for low-level waste shall be transferred with or be traceable to the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if there are procedures requiring that characterization and container data be provided and maintained for each low-level waste transfer and documented records of transfers show that the information is being provided.</p>	<p>See K. above.</p>
<p><u>L. Packaging and Transportation.</u> The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(11)].</p>	<p>DOE Manual 435.1-1 §I.1.E(11) applies to field element managers.</p>
<p>(1) Packaging. If containers are used:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the packaging requirement is demonstrated by: (1) procedures which document proper packaging protocols; and (2) no trends of routine repackaging of low-level waste that is packaged after issuance of DOE O 435.1. Successful performance of this requirement is also demonstrated by a record of containers for which failure has not routinely occurred under management conditions. It is recognized that there may be failed containers for waste previously placed in storage. For those containers, the goal is to only have to repack</p>	<p>MCP-17000 §4. addresses packaging requirements.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
the waste one time after it is retrieved and characterized. Further, acceptable performance is demonstrated by containers of waste having marking and labeling that allows correlation with waste characterization data and container information.	
(a) Low-level waste shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	See (1) above.
(b) When waste is packaged, vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container.	See (1) above.
(c) Containers of low-level waste shall be marked such that their contents can be identified.	See (1) above.
(2) Transportation. To the extent practical, the volume of waste and number of low-level waste shipments shall be minimized. From DOE G 435.1-1 Chapter IV: Compliance with this requirement can be demonstrated by a combination of site procedures directing the efficient use of waste container capacity and documentation showing that low-level waste shipments are systematically planned and optimized to the extent practical.	NA; waste is not shipped to an offsite facility for final disposition from this facility.
M. <u>Site Evaluation and Facility Design</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this requirement addresses new radioactive waste management facilities.
(1) Site Evaluation. Proposed locations for low-level waste facilities shall be evaluated to identify relevant features that should be avoided or must be considered in facility design and analyses.	See M. above.
(a) Each site proposed for a new low-level waste facility or expansion of an existing low-level waste facility shall be evaluated considering environmental characteristics, geotechnical characteristics, and human activities, including for a low-level waste disposal facility, the capability of the site to demonstrate, at a minimum, whether it is:	See M. above.
1 Located to accommodate the projected volume of waste to be received;	See M. above.
2 Located in a flood plain, a tectonically active area, or in the zone of water table fluctuation; and	See M. above.
3 Located where radionuclide migration pathways are predictable and erosion and surface runoff can be	See M. above.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
controlled.	
(b) Proposed sites with environmental characteristics, geotechnical characteristics, and human activities for which adequate protection cannot be provided through facility design shall be deemed unsuitable for the location of the facility.	See M. above.
(c) Low-level waste disposal facilities shall be sited to achieve long-term stability and to minimize, to the extent practical, the need for active maintenance following final closure.	See M. above.
(2) Low-Level Waste Treatment and Storage Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	See M. above.
1 Design of low-level waste treatment and storage facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a non-flammable and nonexplosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Consideration of Decontamination and Decommissioning. Areas in new and modifications to existing low-level waste management facilities that are subject to contamination with radioactive or other hazardous materials shall be designed to facilitate decontamination. For such facilities a proposed decommissioning method or a conversion method leading to reuse shall be described.	See M. above.
(d) Instrumentation and Control Systems. Engineering controls shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide volume inventory data and to prevent spills, leaks, and overflows from tanks or confinement systems.	See M. above.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
(e) Monitoring. Monitoring and/or leak detection capabilities shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide rapid identification of failed confinement and/or other abnormal conditions.	See M. above.
(3) Low-Level Waste Disposal Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	
1 Design of low-level waste disposal facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a nonflammable and non-explosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Stability. Low-level waste disposal facilities shall be designed to achieve long-term stability and to minimize to the extent practical, the need for active maintenance following final closure.	See M. above.
(d) Control of Water. Low-level waste disposal facilities shall be designed to minimize to the extent practical, the contact of waste with water during and after disposal.	See M. above.
N. <u>Storage and Staging</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(13)].	DOE Manual 435.1-1 §I.2.F(13) applies to field element managers.
(1) Storage Prohibitions. Low-level waste in storage shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water. Prior to storage, pyrophoric materials shall be treated, prepared, and packaged to be nonflammable. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by having waste	NA; this facility does not store LLW.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
acceptance requirements which prohibit low-level waste that is ignitable or explosive from being accepted for storage unless it has been treated, and procedures for properly preparing such materials for safe storage.	

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(2) Storage Limit. Low-level waste that has an identified path to disposal shall not be stored longer than one year prior to disposal, except for storage for decay, or as otherwise authorized by the Field Element Manager.</p> <p>From DOE G 435.1-1 Chapter IV: Storage longer than one year can be justified if the conditions for such storage are approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Storage for radioactive decay for a period greater than 1 year for waste that has an identified path to disposal is allowed. Adequate justification and the supporting information for storage for decay is to be documented in the radioactive waste management basis for the facility in which the storage will take place.</p> <p><u>Mixed waste.</u> Under the Federal Facility Compliance Act of 1992, DOE sites were required to develop Site Treatment Plans to bring stored mixed low-level waste into compliance with these requirements. The Site Treatment Plan needs to be consulted and any mixed low-level waste stored for the purpose of accumulation to facilitate treatment must meet Resource Conservation and Recovery Act storage requirements. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement and include appropriate provisions in the radioactive waste management basis for the facility in which it is stored.</p> <p><u>Legacy waste.</u> As discussed above, the intention of the requirement is not to force malicious compliance or heroic actions which would result in increased risk or safety concerns. Rather, the intention is that waste in storage longer than one year receives additional attention to ensure that the public, the workers, and the environment are protected from the hazards of the waste, and that progress is being made to dispose of the waste. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement:</p> <ol style="list-style-type: none"> 1) the radioactive waste management basis allows for storage for no more than one year. 2) the radioactive waste management basis allows for storage for no more than one year, or for storage for decay only for periods greater than a year, which are specified on a radionuclide basis. 	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>3) the radioactive waste management basis allows for storage for more than one year, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>4) the radioactive waste management basis allows for storage for decay (with specifics) and for storage for more than one year for other low-level waste, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>Compliance with this requirement is demonstrated by the existence of a radioactive waste management basis for the storage facility approved by the Field Element Manager that includes the time frames that waste are allowed to be stored, the necessary justifications for storage for decay, and the necessary technical evaluations if storage is to extend significantly beyond the one-year time frame.</p>	
<p>(3) Storage Integrity. Low-level waste shall be stored in a location and manner that protects the integrity of waste for the expected time of storage and minimizes worker exposure.</p> <p>From DOE G 435.1-1 Chapter IV: However, in making a decision to use a facility for storage and in developing a radioactive waste management basis for the activity, particular attention to protection of workers is needed.</p> <p>Compliance with this requirement is demonstrated if sites have storage capabilities for low-level waste that provide protection to waste containers so that their integrity will not be damaged through physical or chemical (corrosion) processes and that keep personnel from spending extended periods of time in the areas where low-level waste is stored.</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>
<p>(4) Waste Characterization for Storage.</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>
<p>(a) Low-level waste that does not have an identified path to disposal shall be characterized as necessary to meet the data quality objectives and minimum characterization requirements of this Chapter, to ensure safe storage, and to facilitate disposal.</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(b) Characterization information for all low-level waste in storage shall be maintained as a record in accordance with the requirements for Records Management in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by documented procedures for managing waste characterization and container information on low-level waste as a Federal record. The records are managed per the applicable policies and procedures for records management referenced in DOE O 200.1 and established at the applicable Field Element.</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>
<p>(5) Container Inspection. A process shall be developed and implemented for inspecting and maintaining containers of low-level waste to ensure container integrity is not compromised.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by: (1) a documented process for waste container inspection and maintenance; and (2) documentation for all waste container inspections and maintenance actions performed.</p>	<p>LI-435 requires quarterly inspections of radioactive waste containers if waste is stored outdoors or has been in storage for greater than 1 year.</p>
<p>(6) Storage Management. Low-level waste storage shall be managed to identify and segregate low-level waste from mixed low-level waste.</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>
<p>(7) Staging. Staging of low-level waste shall be for the purpose of the accumulation of such quantities of waste as necessary to facilitate transportation, treatment, and disposal. Staging longer than 90 days shall meet the requirements for storage above and in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: The staging of low-level waste needs to be addressed in the radioactive waste management basis for the facility that is performing the staging. Generators, treatment facilities, and disposal facilities that stage waste must ensure that the action of staging is included and authorized as part of their radioactive waste management basis for the affected facilities, operations, or activities.</p> <p>Staging longer than 90 days must be justified, the conditions for such storage met, and these practices approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Compliance with this requirement is demonstrated by a staging program that limits the temporary storage of waste to only circumstances allowed in the requirement, including justifications for any staging that exceeds the</p>	<p>Routine LLW, such as personnel protective equipment, is accumulated at this facility for disposal. MCP-17000, Appendix F, "Container Start Date and Storage Prohibitions," restricts staging LLW to 90 days maximum at any generator or treatment facility prior to acceptance by a storage facility.</p> <p>As stated in DOE Guide 435.1-1 §IV.N.(7), staging waste in accordance with this requirement allows waste to be accumulated without being considered storage and being bound by the associated storage requirements.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
90-day period, which is documented in the radioactive waste management basis for the facility.	
<p>O. <u>Treatment</u>. Low-level waste treatment to provide more stable waste forms and to improve the long-term performance of a low-level waste disposal facility shall be implemented as necessary to meet the performance objectives of the disposal facility.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated when a treatment facility or process ensures that treated waste will meet the minimum waste form requirements of DOE M 435.1 and meet additional disposal facility-specific waste acceptance requirements for additional stability or long-term performance of facilities that will receive the treated waste.</p>	NA; this facility does not treat LLW.
P. <u>Disposal</u> . Low-level waste disposal facilities shall meet the following requirements.	NA; this facility does not dispose of LLW.
(1) Performance Objectives. Low-level waste disposal facilities shall be sited, designed, operated, maintained, and closed so that a reasonable expectation exists that the following performance objectives will be met for waste disposed of after September 26, 1988:	See P. above.
(a) Dose to representative members of the public shall not exceed 25 mrem (0.25 mSv) in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air.	See P. above.
(b) Dose to representative members of the public via the air pathway shall not exceed 10 mrem (0.10 mSv) in a year total effective dose equivalent, excluding the dose from radon and its progeny.	See P. above.
(c) Release of radon shall be less than an average flux of 20 pCi/m ² /s (0.74Bq/m ² /s) at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/l (0.0185 Bq/l) of air may be applied at the boundary of the facility.	See P. above.
(2) Performance Assessment. A site-specific radiological performance assessment shall be prepared and maintained for DOE low-level waste disposed of after September 26, 1988. The performance assessment shall include calculations for a 1,000 year period after closure of potential doses to representative future members of the public and potential releases from the facility to provide a reasonable expectation that the performance objectives identified in this Chapter are not exceeded as a result of operation and closure of the facility.	See P. above.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
(a) Analyses performed to demonstrate compliance with the performance objectives in this Chapter, and to establish limits on concentrations of radionuclides for disposal based on the performance measures for inadvertent intruders in this Chapter shall be based on reasonable activities in the critical group of exposed individuals. Unless otherwise specified, the assumption of average living habits and exposure conditions in representative critical groups of individuals projected to receive the highest doses is appropriate. The likelihood of inadvertent intruder scenarios may be considered in interpreting the results of the analyses and establishing radionuclide concentrations, if adequate justification is provided.	See P. above.
(b) The point of compliance shall correspond to the point of highest projected dose or concentration beyond a 100 meter buffer zone surrounding the disposed waste. A larger or smaller buffer zone may be used if adequate justification is provided.	See P. above.
(c) Performance assessments shall address reasonably foreseeable natural processes that might disrupt barriers against release and transport of radioactive materials.	See P. above.
(d) Performance assessments shall use DOE-approved dose coefficients (dose conversion factors) for internal and external exposure of reference adults.	See P. above.
(e) The performance assessment shall include a sensitivity/uncertainty analysis.	See P. above.
(f) Performance assessments shall include a demonstration that projected releases of radionuclides to the environment shall be maintained as low as reasonably achievable (ALARA).	See P. above.
(g) For purposes of establishing limits on radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts to water resources.	See P. above.
(h) For purposes of establishing limits on the concentration of radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts calculated for a hypothetical person assumed to inadvertently intrude for a temporary period into the low-level waste disposal facility. For intruder analyses, institutional controls shall be assumed to be effective in deterring intrusion for at least 100 years following closure. The intruder analyses shall use performance measures for chronic and acute exposure scenarios, respectively, of 100 mrem (1 mSv) in a year and 500 mrem (5 mSv) total effective dose	See P. above.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
equivalent excluding radon in air.	
(3) Composite Analysis. For disposal facilities which received waste after September 26, 1988, a site-specific radiological composite analysis shall be prepared and maintained that accounts for all sources of radioactive material that may be left at the DOE site and may interact with the low-level waste disposal facility, contributing to the dose projected to a hypothetical member of the public from the existing or future disposal facilities. Performance measures shall be consistent with DOE requirements for protection of the public and environment and evaluated for a 1,000 year period following disposal facility closure. The composite analysis results shall be used for planning, radiation protection activities, and future use commitments to minimize the likelihood that current low-level waste disposal activities will result in the need for future corrective or remedial actions to adequately protect the public and the environment.	See P. above.
(4) Performance Assessment and Composite Analysis Maintenance. The performance assessment and composite analysis shall be maintained to evaluate changes that could affect the performance, design, and operating bases for the facility. Performance assessment and composite analysis maintenance shall include the conduct of research, field studies, and monitoring needed to address uncertainties or gaps in existing data. The performance assessment shall be updated to support the final facility closure. Additional iterations of the performance assessment and composite analysis shall be conducted as necessary during the post-closure period.	See P. above.
(a) Performance assessments and composite analyses shall be reviewed and revised when changes in waste forms or containers, radionuclide inventories, facility design and operations, closure concepts, or the improved understanding of the performance of the waste disposal facility in combination with the features of the site on which it is located alter the conclusions or the conceptual model(s) of the existing performance assessment or composite analysis.	See P. above.
(b) A determination of the continued adequacy of the performance assessment and composite analysis shall be made on an annual basis, and shall consider the	See P. above.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
results of data collection and analysis from research, field studies, and monitoring.	
(c) Annual summaries of low-level waste disposal operations shall be prepared with respect to the conclusions and recommendations of the performance assessment and composite analysis and a determination of the need to revise the performance assessment or composite analysis.	See P. above.
(5) Disposal Authorization. A disposal authorization statement shall be obtained prior to construction of a new low-level waste disposal facility. Field Elements with existing low-level waste disposal facilities shall obtain a disposal authorization statement in accordance with the schedule in the Complex-Wide Low-Level Waste Management Program Plan. The disposal authorization statement shall be issued based on a review of the facility's performance assessment, composite analysis, performance assessment and composite analysis maintenance, preliminary closure plan, and preliminary monitoring plan. The disposal authorization statement shall specify the limits and conditions on construction, design, operations, and closure of the low-level waste facility based on these reviews. A disposal authorization statement is a part of the radioactive waste management basis for a disposal facility. Failure to obtain a disposal authorization statement by the implementation date of this Order shall result in shutdown of the disposal facility.	See P. above.
(6) Disposal Facility Operations. The disposal facility design and operation must be consistent with the disposal facility closure plan and lead to disposal facility closure that provides a reasonable expectation that performance objectives will be met. Low-level waste shall be disposed in such a manner that achieves the performance objectives stated in this Chapter, consistent with the disposal facility radiological performance assessment. Additional requirements include:	See P. above.
(a) Operating procedures shall be developed and implemented for low-level waste disposal facilities that protect the public, workers, and the environment; ensure the security of the facility; minimize subsidence during and after waste emplacement; achieve long-term stability and minimize the need for long-term active maintenance; and meet the requirements of the closure/post-closure plan.	See P. above.
(b) Permanent identification markers for disposal excavations and monitoring wells shall be emplaced.	See P. above.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
(c) Low-level waste placement into disposal units shall minimize voids between waste containers. Voids within disposal units shall be filled to the extent practical. Uncontainerized bulk waste shall also be placed in a manner that minimizes voids and subsidence.	
(d) Operations are to be conducted so that active waste disposal operations will not have an adverse effect on any other disposal units.	See P. above.
(e) Operations shall include a process for tracking and documenting low-level waste placement in the facility by generator source.	See P. above.
(7) Alternate Requirements for Low-Level Waste Disposal Facility Design and Operation. Requirements other than those set forth in this Section for the design and operation of a low-level waste disposal facility may be approved on a specific basis if a reasonable expectation is demonstrated that the disposal performance objectives will be met.	See P. above.
Q. <u>Closure</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this facility does not dispose of LLW.
(1) Disposal Facility Closure Plans. A preliminary closure plan shall be developed and submitted to Headquarters for review with the performance assessment and composite analysis. The closure plan shall be updated following issuance of the disposal authorization statement to incorporate conditions specified in the disposal authorization statement. Closure plans shall:	See Q. above.
(a) Be updated as required during the operational life of the facility.	See Q. above.
(b) Include a description of how the disposal facility will be closed to achieve long-term stability and minimize the need for active maintenance following closure and to ensure compliance with the requirements of DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(c) Include the total expected inventory of wastes to be disposed of at the facility over the operational life of the facility.	See Q. above.
(2) Disposal Facility Closure. Closure of a disposal facility shall occur within a five-year period after it is filled to capacity, or after the facility is otherwise determined to be no longer needed.	See Q. above.
(a) Prior to facility closure, the final inventory of the low-level waste disposed in the facility shall be	See Q. above.

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
prepared and incorporated in the performance assessment and composite analysis which shall be updated to support the closure of the facility.	
(b) A final closure plan shall be prepared based on the final inventory of waste disposed in the facility, the plan implemented, and the updated performance assessment and composite analysis prepared in support of the facility closure.	See Q. above.
(c) Institutional control measures shall be integrated into land use and stewardship plans and programs, and shall continue until the facility can be released pursuant to DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(d) The location and use of the facility shall be filed with the local authorities responsible for land use and zoning.	See Q. above.
R. <u>Monitoring</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(7)].	DOE Manual 435.1-1 §I.1.E(7) applies to field element managers.
<p>(1) All Waste Facilities. Parameters that shall be sampled or monitored, at a minimum, include: temperature, pressure (for closed systems), radioactivity in ventilation exhaust and liquid effluent streams, and flammable or explosive mixtures of gases. Facility monitoring programs shall include verification that passive and active control systems have not failed.</p> <p>From DOE G 435.1-1 Chapter IV: The minimum parameters specified in the requirement were selected based on their potential significance for anticipating and identifying undesirable conditions at low-level waste management facilities. Each facility's radioactive waste management basis should include an evaluation of the applicability and significance of the minimum parameters. This evaluation also needs to consider additional parameters to be sampled or monitored to ensure the protection of the public health, the environment, and the workers. If a minimum parameter specified in the requirement is deemed to be not applicable in any way to the active operation of that facility, then that justification should be included in the radioactive waste management basis and when approved constitutes an exemption to the manual.</p> <p>Verification activities are part of the radioactive waste management basis as a condition for operation and documented appropriately.</p> <p>Compliance with this requirement is demonstrated if monitoring or sampling for the stated parameters is</p>	<p>Monitoring requirements at INL radioactive waste management facilities are tailored for the specific facility to enable timely indication of developing problems. Existing radiological control procedures and assessments are followed/completed to monitor waste facilities.</p> <p>LRD-15001 and MCP-139 specify methods and frequency of radiological control surveys of all radiological areas. MCP-139 specifies the use of Form 441.A34. This form is referred to as the "routine sheet" and is to be used by facility radiological control foremen to list radiological areas that are to be surveyed, the survey periods, and methods.</p>

Table 3. (continued).

Facility Name: IF-603, Laboratory C19 Carbon Characterization Laboratory	
Chapter IV, LLW Requirements	Facility Compliance Information
performed for all facilities with a precision, accuracy, and frequency consistent with timely identification of developing problems and a justification exists in the approved radioactive waste management basis for those specified parameters which are not monitored or sampled.	
(2) Liquid Waste Storage Facilities. For facilities storing liquid low-level waste, the following shall also be monitored: liquid level and/or waste volume, and significant waste chemistry parameters.	NA; liquid LLW is not stored in this facility.
(3) Disposal Facilities. A preliminary monitoring plan for a low-level waste disposal facility shall be prepared and submitted to Headquarters for review with the performance assessment and composite analysis. The monitoring plan shall be updated within one year following issuance of the disposal authorization statement to incorporate and implement conditions specified in the disposal authorization statement.	NA; this facility does not dispose of LLW.
(a) The site-specific performance assessment and composite analysis shall be used to determine the media, locations, radionuclides, and other substances to be monitored.	See (3) above.
(b) The environmental monitoring program shall be designed to include measuring and evaluating releases, migration of radionuclides, disposal unit subsidence, and changes in disposal facility and disposal site parameters which may affect long-term performance.	See (3) above.
(c) The environmental monitoring programs shall be capable of detecting changing trends in performance to allow application of any necessary corrective action prior to exceeding the performance objectives in this Chapter.	See (3) above.

4.4 IF-603, Laboratory 103

1. **Facility description:** See the IF-603 facility description provided in Section 5.1.
2. **Hazard category:** LTHC3 radiological
3. **Radioactive waste managed at this facility:** Routine contact-handled LLW and mixed LLW is generated and staged at this facility. This facility also has potential to generate liquid mixed LLW.

NOTE: Although current Laboratory 103 process operations do not include elementary neutralization, the facility has the capability to perform containerized elementary neutralization as provided by LWP-8000, "Environmental Instructions for Facilities, Processes, Materials and Equipment." BEA officials requested that the RWMB reflect this capability. Therefore, the Table 4 compliance information below features an entry at requirement D.(2) addressing the treatment facilities requirements and states that this facility is not a treatment facility although the elementary neutralization capability is present if needed.

4. **RWMB documents/programs:**

- a) Safety basis/hazard analysis:
 - EDF-7862, “Hazard Classification for the INL Research Center (IRC)”
- b) Laboratory-wide:
 - Form 435.39, “Waste Determination and Disposition Form (WDDF)”
 - Form 435.42, “Radioactive Waste Inventory Sheet”
 - Form 441.A34, “INL Radiological Control Required Surveys”
 - LI-435, “Waste Management Routine Field Activities”
 - LRD-15001, “Radiological Control Manual”
 - LWP-8000, “Environmental Instructions for Facilities, Processes, Materials and Equipment”
 - LWP-13840, “Management of Issues, Observations, and Noteworthy Practices”
 - LWP-14002, “Timeout and Stop Work Authority”
 - LWP-15011, “Radioactive Material Areas and Radioactive Storage Areas”
 - LWP-17000, “Waste Management”
 - MCP-139, “Radiological Surveys”
 - MCP-17000, “Waste Generator Services Waste Management”
 - MCP-17410, “Management of Waste Storage Areas”
 - MCP-17500, “Waste Generator Services Certification of Waste Shipments to the Nevada Test Site”
 - PDD-17000, “Waste Management Program”
 - PLN-114, “INL Emergency Plan/RCRA Contingency Plan”
 - PLN-522, “Quality Assurance Program Plan for the Waste Management/Waste Certification Program”
- c) Facility-specific:
 - LI 1227-07-IRC, “Microbial Research Using Solvents, Hazardous Metals and Radionuclides”

LLW is managed at this facility. Table 4 presents the facility compliance information for Chapter IV, “Low-level Waste Requirements.”

Table 4. IF-603, Laboratory 103, DOE Manual 435.1-1 low-level waste requirements and facility compliance information.

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>A. <u>Definition of Low-Level Waste</u>. Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the <i>Atomic Energy Act of 1954</i>, as amended), or naturally occurring radioactive material.</p> <p>(From DOE G 435.1-1 Chapter IV: Low-level radioactive waste is defined by what it is not. The guidance on definitions in Chapters II and III should be consulted first for making a determination on how to properly manage a suspect waste stream.)</p>	<p>This requirement provides the criteria for determining which DOE radioactive waste is to be managed as LLW in accordance with DOE Manual 435.1-1, Chapter IV.</p> <p>Radioactive waste managed at this facility under the requirements of this chapter is not managed under the requirements of DOE Manual 435.1-1, Chapter II or Chapter III.</p>

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
B. <u>Management of Specific Wastes</u> . The following provide for management of specific wastes as low-level waste in accordance with the requirements in this Chapter:	See (1), (2), (3), (4) below.
(1) Mixed Low-Level Waste. Low-level waste determined to contain both source, special nuclear, or byproduct material subject to the <i>Atomic Energy Act of 1954</i> , as amended, and a hazardous component subject to the <i>Resource Conservation and Recovery Act</i> (RCRA), as amended, shall be managed in accordance with the requirements of RCRA and DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	This facility manages mixed LLW in SAAs. Management of SAAs is addressed in MCP-17410 and overall management of mixed waste is addressed in MCP-17000.
(2) TSCA-Regulated Waste. Low-level waste containing polychlorinated biphenyls, asbestos, or other such regulated toxic components shall be managed in accordance with requirements derived from the <i>Toxic Substances Control Act</i> , as amended, DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	NA; this facility does not manage TSCA-regulated waste.
(3) Accelerator-Produced Waste. Radioactive waste produced as a result of operations of DOE accelerators is low-level waste and shall be managed in accordance with DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual, and all applicable Federal or State requirements.	NA; this facility does not manage accelerator-produced waste.
(4) 11e.(2) and Naturally Occurring Radioactive Material. Small quantities of 11e.(2) byproduct material and naturally occurring radioactive material may be managed as low-level waste provided they can be managed to meet the requirements for low-level waste disposal in Section IV.P of this Manual.	NA; this facility does not manage naturally occurring radioactive material.
C. <u>Complex-Wide Low-Level Waste Management Program</u> . A complex-wide program and plan shall be developed as described under <i>Responsibilities</i> , 2.B and 2.D, in Chapter I of this Manual.	Not a facility-specific requirement. DOE Manual 435.1-1 §I.2.B and §I.2.D apply to the Assistant Secretary for Environmental Management and the Deputy Assistant Secretary for Waste Management, respectively.
D. <u>Radioactive Waste Management Basis</u> . Low-level waste facilities, operations, and activities shall have a radioactive waste management basis consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment. The following specific waste management controls shall be part of the radioactive waste management basis:	The RWMB provides the regulatory framework for management of radioactive waste at INL. It specifically identifies facility management and implementing documents for the generation, storage, treatment, and disposal of radiological waste.
(1) Generators. The waste certification program. From DOE G 435.1-1 Chapter IV: For a facility that generates low-level waste, the radioactive waste management basis is to include the program for certifying that waste meets the waste acceptance requirements of the facility(ies) to which the waste will be sent.	See J. below for waste certification program requirements. EDF-7862 establishes laboratory facilities at the IF-603 facility as LTHC3 facilities.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(2) Treatment Facilities. certification program. The waste acceptance requirements and the waste [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	<p>NA; LLW is not treated at this facility.</p> <p>Containerized elementary neutralization is performed at this facility as provided by LWP-8000. As stated in §4.118, elementary neutralization of corrosive hazardous waste may take place at any location where waste is generated or stored, and neither a generator treatment plan nor a permit is required. Solidification of liquid LLW for the purpose of staging (not for treating the radioactive constituents) also may be performed. Therefore, this facility is not considered to be a treatment facility.</p>
<p>(3) Storage Facilities. The waste acceptance requirements and the waste certification program.</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	<p>NA; this facility stages waste in accordance with N.(7) to facilitate treatment or disposal.</p>
<p>(4) Disposal Facilities. The performance assessment, composite analysis, disposal authorization statement, closure plan, waste acceptance requirements, and</p>	<p>NA; this facility is not a disposal facility.</p>

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
monitoring plan.	
E. <u>Contingency Actions</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(5)].	DOE Manual 435.1-1 §I.1.E(5) addresses the sitewide emergency management system. The INL plan is provided in PLN-114.
<p>(1) Contingency Storage. For off-normal or emergency situations involving high activity or high hazard liquid low-level waste storage or treatment, spare capacity with adequate capabilities shall be maintained to receive the largest volume of liquid contained in any one storage tank or treatment facility. Tanks or other facilities that are designated low-level waste contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store liquid LLW.
<p>(2) Transfer Equipment. Pipelines and auxiliary facilities necessary for the transfer of high activity or high hazard liquid low-level waste to contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store or treat liquid LLW.
<p>F. <u>Corrective Actions</u>. I of this Manual. The following requirements are in addition to those in Chapter [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with DOE M 435.1-1 §I.2.G.(1) is demonstrated by records showing what corrective actions were taken to remedy situations in the radioactive waste management system.</p>	<p>The INL-wide procedure addressing problem identification as required by DOE Manual 435.1-1 §I.2.G.(1) is LWP-13840, which implements the laboratory's corrective action system.</p> <p>The INL-wide procedure addressing shutdown or curtailment of activities as required by DOE</p>

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
Compliance with DOE M 435.1-1 §I.2.G.(2) is demonstrated by having the necessary procedures, mechanisms, and training in place to effect shutdown or curtailment of activities which pose an imminent danger or other serious hazard to workers or the public, or are not protective of the environment.	Manual 435.1-1 §I.2.G.(2) is LWP-14002.
<p>(1) Order Compliance. Corrective actions shall be implemented whenever necessary to ensure the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual are met.</p> <p>From DOE G 435.1-1 Chapter IV: If a facility or activity can be allowed to operate while a noncompliant or hazardous condition exists, the allowance and any associated limitations must be defined as part of the facility or activity's radioactive waste management basis, identified as a configuration controlled item in a configuration management plan or included in a revision or modification to an operating procedure or similar controlled documentation.</p> <p>Compliance with this requirement is demonstrated if a corrective action system addresses noncompliant or hazardous situations involving low-level waste management facilities in a systematic fashion, and allows identification of problems by all personnel.</p>	See F. above.
<p>(2) Operations Curtailment. Operations shall be curtailed or facilities shut down for failure to establish, maintain, or operate consistent with an approved radioactive waste management basis.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated with a documented system of routine assessments to determine whether waste management activities and facilities are operating in accordance with an approved radioactive waste management basis that provides for graded limitations that can be placed on activities and operations that do not have, or are operating outside of, an approved radioactive waste management basis, including shutdown of the facility.</p>	The approved RWMB establishes the current compliance status at each radioactive waste management facility. Facility assessments are scheduled to ensure waste management activities are conducted in accordance with the approved RWMB.
G. <u>Waste Acceptance</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(6)].	DOE Manual 435.1-1 §I.2.F(6) applies to field element managers.
<p>(1) Technical and Administrative. Waste acceptance requirements for all low-level waste storage, treatment, or disposal facilities, operations, and activities shall specify, at a minimum, the following:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these waste acceptance requirements is demonstrated if they</p>	NA; this facility does not accept LLW from other facilities.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
are documented, contain clear and precise criteria specifying the radionuclide limits in the form of contents or concentrations that can be accepted, the limitations and prohibitions on waste forms and packages that can be received, and the limits, prohibitions, or instructions concerning any other technical information so that the waste is compatible with the safety basis of the facility, and which will result in acceptable waste at subsequent steps in managing the low-level waste.	
(a) Allowable activities and/or concentrations of specific radionuclides.	See (1) above.
(b) Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal.	See (1) above.
(c) Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance.	See (1) above.
(d) The following are additional waste acceptance requirements that shall be specified in low-level waste disposal facility waste acceptance requirements:	See (1) above.
1 Low-level waste must contribute to and not detract from achieving long-term stability of the facility, minimizing the need for long-term active maintenance, minimizing subsidence, and minimizing contact of water with waste. Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical.	See (1) above.
2 Liquid low-level waste or low-level waste containing free liquid must be converted into a form that contains as little freestanding liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the waste volume when the low-level waste is in a disposal container, or 0.5 percent of the waste volume after it is processed to a stable form.	See (1) above.
3 Low-level waste must not be readily capable of detonation or of explosive decomposition or reaction at anticipated pressures and temperatures, or of explosive reaction with water. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.	See (1) above.
4 Low-level waste must not contain, or be capable of generating by radiolysis or biodegradation, quantities of toxic gases, vapors, or fumes harmful to the public or workers or disposal facility personnel, or harmful to the long-term structural stability of the disposal site.	See (1) above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
5 Low-level waste in a gaseous form must be packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20 C. [sic]	See (1) above.
<p>(e) The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.</p> <p>From DOE G 435.1-1 Chapter IV: Waste acceptance requirements are acceptable if they are documented and contain a clear description of the procedure and bases for obtaining an exception or deviation to the acceptance criteria for low-level waste to be received at the facility.</p>	See (1) above.
<p>(2) Evaluation and Acceptance. The receiving facility shall evaluate waste for acceptance, including confirmation that the technical and administrative requirements have been met. A process for the disposition of non-conforming wastes shall be established.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the waste acceptance requirements for a low-level waste management facility is demonstrated if they include a process for evaluation and acceptance of incoming waste to ensure the acceptance criteria of the facility receiving the waste are met that includes one of or a combination of: (1) testing, sampling, and analysis of representative samples of waste upon receipt; (2) testing, sampling, and analysis of split samples of waste taken at the generator site; (3) evaluation of testing, sampling, and analysis of data provided by the generator, or (4) audits, reviews, surveillance, or observations of generator waste certification programs and characterization activities. Additionally, acceptable waste acceptance requirements for a storage, treatment or disposal facility will have documented procedures and actions to be taken if a waste that does not conform to the waste acceptance criteria is received at the facility.</p>	See (1) above.
H. <u>Waste Generation Planning</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(7)].	DOE Manual 435.1-1 §I.2.F(7) applies to field element managers.
<p>(1) Life-Cycle Planning. Prior to waste generation, planning shall be performed to address the entire life cycle for all low-level waste streams.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this planning requirement is demonstrated by the individual sites establishing a process for evaluating the life-cycle of</p>	<p>PDD-17000 and LWP-17000 provide direction to the waste generators for waste generation planning to address the entire life cycle.</p> <p>Form 435.39 and Form 435.42 are used for this activity.</p>

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
low-level waste prior to its generation, including the identification of low-level wastes with no path to disposal and appropriate records justifying the newly generated low-level waste stream(s), and site personnel possessing planning information showing the location(s) where low-level waste will be stored, treated, and/or disposed along with a confirmation that the personnel managing the facilities agree that the low-level waste may be managed at those facilities.	
(2) Waste with No Identified Path to Disposal. Low-level waste streams with no identified path to disposal shall be generated only in accordance with approved conditions which, at a minimum, shall address:	This facility is not generating radioactive waste that does not have an identified path to disposal.
(a) Programmatic need to generate the waste;	See (2) above.
(b) Characteristics and issues preventing the disposal of the waste;	See (2) above.
(c) Safe storage of the waste until disposal can be achieved; and	See (2) above.
(d) Activities and plans for achieving final disposal of the waste.	See (2) above.
I. <u>Waste Characterization</u> . Low-level waste shall be characterized using direct or indirect methods, and the characterization documented in sufficient detail to ensure safe management and compliance with the waste acceptance requirements of the facility receiving the waste. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program for documenting and the existence of records that document the process for acquiring and verifying the validity of low-level waste characterization data acquired through the use of direct or indirect methods.	MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information. Laboratory Instruction 1227-07-IRC, Table 2.03 provides very general characterization information regarding the waste types and volumes generated subsequent to routine laboratory operations. The table also provides the method of disposal.
(1) Data Quality Objectives. The data quality objectives process, or a comparable process, shall be used for identifying characterization parameters and acceptable uncertainty in characterization data. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the documented use of a data quality objectives or a comparable process for determining the type, quantity, and quality of characterization data needed to safely manage low-level waste.	Radioactive waste management facilities characterize waste in accordance with the requirements of the receiving storage, treatment, or disposal facility. The documented use of a data quality objectives process, or comparable process, was not identified for this facility.
(2) Minimum Waste Characterization. Characterization data shall, at a minimum, include the following information relevant to the management of the waste:	MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the existence of a program or procedure for determining and records that document characterization of low-level waste consistent with the minimum characterization data requirements.	Laboratory Instruction 1227-07-IRC, Table 2.03 provides very general characterization information regarding the waste types and volumes generated subsequent to routine laboratory operations. The table also provides the method of disposal.
(a) Physical and chemical characteristics;	See (2) above.
(b) Volume, including the waste and any stabilization or absorbent media;	See (2) above.
(c) Weight of the container and contents;	See (2) above.
(d) Identities, activities, and concentrations of major radionuclides;	See (2) above.
(e) Characterization date;	See (2) above.
(f) Generating source; and	See (2) above.
(g) Any other information which may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives.	See (2) above.
<p>J. Waste Certification. A waste certification program shall be developed, documented, and implemented to ensure that the waste acceptance requirements of facilities receiving low-level waste for storage, treatment, and disposal are met.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the development and documentation portion of the certification requirement is demonstrated by a waste certification plan that identifies the organizations involved, assigns responsibilities for implementing the program, and describes or references the quality assurance, training, procurement controls, records management, and procedures to be used by the program. Acceptable performance for implementing the program is demonstrated when appropriate personnel are trained and follow the procedures that govern their part of the waste certification. Additionally, acceptable performance is demonstrated if the waste certification plan and procedures are current and controlled in accordance with a document controls program, and records related to certification (e.g., certification statements, training records, procurement records, characterization records, container records) are generated and managed in accordance with the established site program.</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTs profile that captures waste certification information.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p> <p>Container procurement is addressed in MCP-17000 §4.6.</p> <p>Waste certification is performed and tracked using IWTs. Documentation of the IWTs Program is available electronically only.</p> <p>PLN-522 requires waste technical specialists and waste disposition specialists to complete the appropriate training/qualification before being granted approval authority for profiles within the IWTs Program. The waste certification official, alternate waste certification official, and NNSS packaging certifiers must complete the appropriate training/qualifications to disposition waste to NNSS.</p>
(1) Certification Program. The waste certification program shall designate the officials who have the authority to certify and release waste for shipment; and specify what documentation is required for waste	See J. above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>generation, characterization, shipment, and certification. The program shall provide requirements for auditability, retrievability, and storage of required documentation and specify the records retention period.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure for record keeping and records showing that low-level waste is certified as having met the waste acceptance criteria of the facility to which it was transferred and that the certification statement is supported by additional records regarding the waste source, characterization, and container.</p>	
<p>(2) Certification before Transfer. Low-level waste shall be certified as meeting waste acceptance requirements before it is transferred to the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the presence of a certification program which includes procedures requiring a signed certification statement prior to the release of waste for transfer, and by dated records showing that waste was certified before being transferred.</p>	See J. above.
<p>(3) Maintaining Certification. Low-level waste that has been certified as meeting the waste acceptance requirements for transfer to a storage, treatment, or disposal facility shall be managed in a manner that maintains its certification status.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure reflecting this requirement is present and site personnel are able to show that the storage of low-level waste containers is in a facility or manner where the containers would not be damaged by normal weather events, and cannot be accessed by unauthorized personnel. Further, each container can be traced to its certification and the information supporting that certification.</p>	See J. above.
<p>K. <u>Waste Transfer</u>. A documented process shall be established and implemented for transferring responsibility for management of low-level waste and for ensuring availability of relevant data. The following requirements are in addition to those in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if facilities have procedures for the receipt of waste and the transfer of waste, as appropriate, which address the acquisition of waste and container data and the transfer of ownership, respectively. Further evidence of acceptable performance is facility records showing that data on the waste containers is</p>	<p>MCP-17000 specifies the requirements for preparing an IWTS profile that captures waste certification data, transfer information, and associated authorizations.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p>

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
available and accurate, and that documented transfer of responsibility occurs.	
<p>(1) Authorization. Low-level waste shall not be transferred to a storage, treatment, or disposal facility until personnel responsible for the facility receiving the waste authorize the transfer.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by sites having procedures that require a confirmation of authorization before releasing waste for transfer, and records showing that transfers are made in accordance with written authorizations.</p>	See K. above.
<p>(2) Data. Waste characterization data, container information, and generation, storage, treatment, and transportation information for low-level waste shall be transferred with or be traceable to the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if there are procedures requiring that characterization and container data be provided and maintained for each low-level waste transfer and documented records of transfers show that the information is being provided.</p>	See K. above.
L. <u>Packaging and Transportation</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(11)].	DOE Manual 435.1-1 §I.1.E(11) applies to field element managers.
<p>(1) Packaging. If containers are used:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the packaging requirement is demonstrated by: (1) procedures which document proper packaging protocols; and (2) no trends of routine repackaging of low-level waste that is packaged after issuance of DOE O 435.1. Successful performance of this requirement is also demonstrated by a record of containers for which failure has not routinely occurred under management conditions. It is recognized that there may be failed containers for waste previously placed in storage. For those containers, the goal is to only have to repackage the waste one time after it is retrieved and characterized. Further, acceptable performance is demonstrated by containers of waste having marking and labeling that allows correlation with waste characterization data and container information.</p>	MCP-17000 §4 addresses packaging requirements.
(a) Low-level waste shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	See (1) above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
(b) When waste is packaged, vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container.	See (1) above.
(c) Containers of low-level waste shall be marked such that their contents can be identified.	See (1) above.
(2) Transportation. To the extent practical, the volume of waste and number of low-level waste shipments shall be minimized. From DOE G 435.1-1 Chapter IV: Compliance with this requirement can be demonstrated by a combination of site procedures directing the efficient use of waste container capacity and documentation showing that low-level waste shipments are systematically planned and optimized to the extent practical.	NA; waste is not shipped from this facility to an offsite facility for final disposition.
M. <u>Site Evaluation and Facility Design</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this requirement addresses new radioactive waste management facilities.
(1) Site Evaluation. Proposed locations for low-level waste facilities shall be evaluated to identify relevant features that should be avoided or must be considered in facility design and analyses.	See M. above.
(a) Each site proposed for a new low-level waste facility or expansion of an existing low-level waste facility shall be evaluated considering environmental characteristics, geotechnical characteristics, and human activities, including for a low-level waste disposal facility, the capability of the site to demonstrate, at a minimum, whether it is:	See M. above.
1 Located to accommodate the projected volume of waste to be received;	See M. above.
2 Located in a flood plain, a tectonically active area, or in the zone of water table fluctuation; and	See M. above.
3 Located where radionuclide migration pathways are predictable and erosion and surface runoff can be controlled.	See M. above.
(b) Proposed sites with environmental characteristics, geotechnical characteristics, and human activities for which adequate protection cannot be provided through facility design shall be deemed unsuitable for the location of the facility.	See M. above.
(c) Low-level waste disposal facilities shall be sited to achieve long-term stability and to minimize, to the extent practical, the need for active maintenance following final closure.	See M. above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
(2) Low-Level Waste Treatment and Storage Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	See M. above.
1 Design of low-level waste treatment and storage facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a non-flammable and nonexplosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Consideration of Decontamination and Decommissioning. Areas in new and modifications to existing low-level waste management facilities that are subject to contamination with radioactive or other hazardous materials shall be designed to facilitate decontamination. For such facilities a proposed decommissioning method or a conversion method leading to reuse shall be described.	See M. above.
(d) Instrumentation and Control Systems. Engineering controls shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide volume inventory data and to prevent spills, leaks, and overflows from tanks or confinement systems.	See M. above.
(e) Monitoring. Monitoring and/or leak detection capabilities shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide rapid identification of failed confinement and/or other abnormal conditions.	See M. above.
(3) Low-Level Waste Disposal Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
(b) Ventilation.	
1 Design of low-level waste disposal facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a nonflammable and non-explosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Stability. Low-level waste disposal facilities shall be designed to achieve long-term stability and to minimize to the extent practical, the need for active maintenance following final closure.	See M. above.
(d) Control of Water. Low-level waste disposal facilities shall be designed to minimize to the extent practical, the contact of waste with water during and after disposal.	See M. above.
N. <u>Storage and Staging</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(13)].	DOE Manual 435.1-1 §I.2.F(13) applies to Field element managers.
(1) Storage Prohibitions. Low-level waste in storage shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water. Prior to storage, pyrophoric materials shall be treated, prepared, and packaged to be nonflammable. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by having waste acceptance requirements which prohibit low-level waste that is ignitable or explosive from being accepted for storage unless it has been treated, and procedures for properly preparing such materials for safe storage.	NA; this facility does not store LLW.
(2) Storage Limit. Low-level waste that has an identified path to disposal shall not be stored longer than one year prior to disposal, except for storage for decay, or as otherwise authorized by the Field Element Manager. From DOE G 435.1-1 Chapter IV: Storage longer than one year can be justified if the conditions for such storage are approved by the Field Element Manager as part of the radioactive waste management basis for the facility. Storage for radioactive decay for a period greater than 1	NA; this facility does not store LLW. See N. (7) below for staging requirements.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>year for waste that has an identified path to disposal is allowed. Adequate justification and the supporting information for storage for decay is to be documented in the radioactive waste management basis for the facility in which the storage will take place.</p> <p><u>Mixed waste.</u> Under the Federal Facility Compliance Act of 1992, DOE sites were required to develop Site Treatment Plans to bring stored mixed low-level waste into compliance with these requirements. The Site Treatment Plan needs to be consulted and any mixed low-level waste stored for the purpose of accumulation to facilitate treatment must meet Resource Conservation and Recovery Act storage requirements. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement and include appropriate provisions in the radioactive waste management basis for the facility in which it is stored.</p> <p><u>Legacy waste.</u> As discussed above, the intention of the requirement is not to force malicious compliance or heroic actions which would result in increased risk or safety concerns. Rather, the intention is that waste in storage longer than one year receives additional attention to ensure that the public, the workers, and the environment are protected from the hazards of the waste, and that progress is being made to dispose of the waste. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement:</p> <ol style="list-style-type: none"> 1) the radioactive waste management basis allows for storage for no more than one year. 2) the radioactive waste management basis allows for storage for no more than one year, or for storage for decay only for periods greater than a year, which are specified on a radionuclide basis. 3) the radioactive waste management basis allows for storage for more than one year, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives. 4) the radioactive waste management basis allows for storage for decay (with specifics) and for storage for more than one year for other low-level waste, up to a 	

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>Compliance with this requirement is demonstrated by the existence of a radioactive waste management basis for the storage facility approved by the Field Element Manager that includes the time frames that waste are allowed to be stored, the necessary justifications for storage for decay, and the necessary technical evaluations if storage is to extend significantly beyond the one-year time frame.</p>	
<p>(3) Storage Integrity. Low-level waste shall be stored in a location and manner that protects the integrity of waste for the expected time of storage and minimizes worker exposure.</p> <p>From DOE G 435.1-1 Chapter IV: However, in making a decision to use a facility for storage and in developing a radioactive waste management basis for the activity, particular attention to protection of workers is needed.</p> <p>Compliance with this requirement is demonstrated if sites have storage capabilities for low-level waste that provide protection to waste containers so that their integrity will not be damaged through physical or chemical (corrosion) processes and that keep personnel from spending extended periods of time in the areas where low-level waste is stored.</p>	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(4) Waste Characterization for Storage.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(a) Low-level waste that does not have an identified path to disposal shall be characterized as necessary to meet the data quality objectives and minimum characterization requirements of this Chapter, to ensure safe storage, and to facilitate disposal.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
<p>(b) Characterization information for all low-level waste in storage shall be maintained as a record in accordance with the requirements for Records Management in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by documented procedures for managing waste characterization and container information on low-level waste as a Federal record. The records are managed per the applicable policies and procedures for records management referenced in DOE O 200.1 and established at the applicable Field Element.</p>	NA; this facility does not store LLW. See N. (7) below for staging requirements.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(5) Container Inspection. A process shall be developed and implemented for inspecting and maintaining containers of low-level waste to ensure container integrity is not compromised.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by: (1) a documented process for waste container inspection and maintenance; and (2) documentation for all waste container inspections and maintenance actions performed.</p>	<p>LI-435 requires quarterly inspections of radioactive waste containers if waste is stored outdoors or has been in storage for greater than 1 year.</p>
<p>(6) Storage Management. Low-level waste storage shall be managed to identify and segregate low-level waste from mixed low-level waste.</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>
<p>(7) Staging. Staging of low-level waste shall be for the purpose of the accumulation of such quantities of waste as necessary to facilitate transportation, treatment, and disposal. Staging longer than 90 days shall meet the requirements for storage above and in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: The staging of low-level waste needs to be addressed in the radioactive waste management basis for the facility that is performing the staging. Generators, treatment facilities, and disposal facilities that stage waste must ensure that the action of staging is included and authorized as part of their radioactive waste management basis for the affected facilities, operations, or activities.</p> <p>Staging longer than 90 days must be justified, the conditions for such storage met, and these practices approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Compliance with this requirement is demonstrated by a staging program that limits the temporary storage of waste to only circumstances allowed in the requirement, including justifications for any staging that exceeds the 90-day period, which is documented in the radioactive waste management basis for the facility.</p>	<p>Routine LLW, such as personnel protective equipment, is accumulated at this facility for disposal. MCP-17000, Appendix F, "Container Start Date and Storage Prohibitions," restricts staging LLW to 90 days maximum at any generator or treatment facility prior to acceptance by a storage facility.</p> <p>As stated in DOE Guide 435.1-1 §IV.N.(7), staging waste in accordance with this requirement allows waste to be accumulated without being considered storage and being bound by the associated storage requirements.</p>
<p>O. <u>Treatment</u>. Low-level waste treatment to provide more stable waste forms and to improve the long-term performance of a low-level waste disposal facility shall be implemented as necessary to meet the performance objectives of the disposal facility.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated when a treatment facility or process ensures that treated waste will meet the minimum waste form requirements of DOE M 435.1 and meet additional disposal facility-specific waste acceptance requirements for additional stability or long-term</p>	<p>NA; this facility does not treat LLW.</p>

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
performance of facilities that will receive the treated waste.	
P. <u>Disposal</u> . Low-level waste disposal facilities shall meet the following requirements.	NA; this facility does not dispose of LLW.
(1) Performance Objectives. Low-level waste disposal facilities shall be sited, designed, operated, maintained, and closed so that a reasonable expectation exists that the following performance objectives will be met for waste disposed of after September 26, 1988:	See P. above.
(a) Dose to representative members of the public shall not exceed 25 mrem (0.25 mSv) in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air.	See P. above.
(b) Dose to representative members of the public via the air pathway shall not exceed 10 mrem (0.10 mSv) in a year total effective dose equivalent, excluding the dose from radon and its progeny.	See P. above.
(c) Release of radon shall be less than an average flux of 20 pCi/m ² /s (0.74Bq/m ² /s) at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/l (0.0185 Bq/l) of air may be applied at the boundary of the facility.	See P. above.
(2) Performance Assessment. A site-specific radiological performance assessment shall be prepared and maintained for DOE low-level waste disposed of after September 26, 1988. The performance assessment shall include calculations for a 1,000 year period after closure of potential doses to representative future members of the public and potential releases from the facility to provide a reasonable expectation that the performance objectives identified in this Chapter are not exceeded as a result of operation and closure of the facility.	See P. above.
(a) Analyses performed to demonstrate compliance with the performance objectives in this Chapter, and to establish limits on concentrations of radionuclides for disposal based on the performance measures for inadvertent intruders in this Chapter shall be based on reasonable activities in the critical group of exposed individuals. Unless otherwise specified, the assumption of average living habits and exposure conditions in representative critical groups of individuals projected to receive the highest doses is appropriate. The likelihood of inadvertent intruder scenarios may be considered in interpreting the results of the analyses and establishing radionuclide concentrations, if adequate justification is provided.	See P. above.
(b) The point of compliance shall correspond to the point of highest projected dose or concentration beyond a 100	See P. above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
meter buffer zone surrounding the disposed waste. A larger or smaller buffer zone may be used if adequate justification is provided.	
(c) Performance assessments shall address reasonably foreseeable natural processes that might disrupt barriers against release and transport of radioactive materials.	See P. above.
(d) Performance assessments shall use DOE-approved dose coefficients (dose conversion factors) for internal and external exposure of reference adults.	See P. above.
(e) The performance assessment shall include a sensitivity/uncertainty analysis.	See P. above.
(f) Performance assessments shall include a demonstration that projected releases of radionuclides to the environment shall be maintained as low as reasonably achievable (ALARA).	See P. above.
(g) For purposes of establishing limits on radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts to water resources.	See P. above.
(h) For purposes of establishing limits on the concentration of radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts calculated for a hypothetical person assumed to inadvertently intrude for a temporary period into the low-level waste disposal facility. For intruder analyses, institutional controls shall be assumed to be effective in deterring intrusion for at least 100 years following closure. The intruder analyses shall use performance measures for chronic and acute exposure scenarios, respectively, of 100 mrem (1 mSv) in a year and 500 mrem (5 mSv) total effective dose equivalent excluding radon in air.	See P. above.
(3) Composite Analysis. For disposal facilities which received waste after September 26, 1988, a site-specific radiological composite analysis shall be prepared and maintained that accounts for all sources of radioactive material that may be left at the DOE site and may interact with the low-level waste disposal facility, contributing to the dose projected to a hypothetical member of the public from the existing or future disposal facilities. Performance measures shall be consistent with DOE requirements for protection of the public and environment and evaluated for a 1,000 year period following disposal facility closure. The composite analysis results shall be used for planning, radiation protection activities, and future use commitments to minimize the likelihood that current low-level waste disposal activities will result in the need for future	See P. above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
corrective or remedial actions to adequately protect the public and the environment.	
(4) Performance Assessment and Composite Analysis Maintenance. The performance assessment and composite analysis shall be maintained to evaluate changes that could affect the performance, design, and operating bases for the facility. Performance assessment and composite analysis maintenance shall include the conduct of research, field studies, and monitoring needed to address uncertainties or gaps in existing data. The performance assessment shall be updated to support the final facility closure. Additional iterations of the performance assessment and composite analysis shall be conducted as necessary during the post-closure period.	See P. above.
(a) Performance assessments and composite analyses shall be reviewed and revised when changes in waste forms or containers, radionuclide inventories, facility design and operations, closure concepts, or the improved understanding of the performance of the waste disposal facility in combination with the features of the site on which it is located alter the conclusions or the conceptual model(s) of the existing performance assessment or composite analysis.	See P. above.
(b) A determination of the continued adequacy of the performance assessment and composite analysis shall be made on an annual basis, and shall consider the results of data collection and analysis from research, field studies, and monitoring.	See P. above.
(c) Annual summaries of low-level waste disposal operations shall be prepared with respect to the conclusions and recommendations of the performance assessment and composite analysis and a determination of the need to revise the performance assessment or composite analysis.	See P. above.
(5) Disposal Authorization. A disposal authorization statement shall be obtained prior to construction of a new low-level waste disposal facility. Field Elements with existing low-level waste disposal facilities shall obtain a disposal authorization statement in accordance with the schedule in the Complex-Wide Low-Level Waste Management Program Plan. The disposal authorization statement shall be issued based on a review of the facility's performance assessment, composite analysis,	See P. above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
performance assessment and composite analysis maintenance, preliminary closure plan, and preliminary monitoring plan. The disposal authorization statement shall specify the limits and conditions on construction, design, operations, and closure of the low-level waste facility based on these reviews. A disposal authorization statement is a part of the radioactive waste management basis for a disposal facility. Failure to obtain a disposal authorization statement by the implementation date of this Order shall result in shutdown of the disposal facility.	
(6) Disposal Facility Operations. The disposal facility design and operation must be consistent with the disposal facility closure plan and lead to disposal facility closure that provides a reasonable expectation that performance objectives will be met. Low-level waste shall be disposed in such a manner that achieves the performance objectives stated in this Chapter, consistent with the disposal facility radiological performance assessment. Additional requirements include:	See P. above.
(a) Operating procedures shall be developed and implemented for low-level waste disposal facilities that protect the public, workers, and the environment; ensure the security of the facility; minimize subsidence during and after waste emplacement; achieve long-term stability and minimize the need for long-term active maintenance; and meet the requirements of the closure/post-closure plan.	See P. above.
(b) Permanent identification markers for disposal excavations and monitoring wells shall be emplaced.	See P. above.
(c) Low-level waste placement into disposal units shall minimize voids between waste containers. Voids within disposal units shall be filled to the extent practical. Uncontainerized bulk waste shall also be placed in a manner that minimizes voids and subsidence.	
(d) Operations are to be conducted so that active waste disposal operations will not have an adverse effect on any other disposal units.	See P. above.
(e) Operations shall include a process for tracking and documenting low-level waste placement in the facility by generator source.	See P. above.
(7) Alternate Requirements for Low-Level Waste Disposal Facility Design and Operation. Requirements other than those set forth in this Section for the design and operation of a low-level waste disposal facility may be approved on a specific basis if a reasonable expectation is demonstrated that the disposal performance objectives will be met.	See P. above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
Q. <u>Closure</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this facility does not dispose of LLW.
(1) Disposal Facility Closure Plans. A preliminary closure plan shall be developed and submitted to Headquarters for review with the performance assessment and composite analysis. The closure plan shall be updated following issuance of the disposal authorization statement to incorporate conditions specified in the disposal authorization statement. Closure plans shall:	See Q. above.
(a) Be updated as required during the operational life of the facility.	See Q. above.
(b) Include a description of how the disposal facility will be closed to achieve long-term stability and minimize the need for active maintenance following closure and to ensure compliance with the requirements of DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(c) Include the total expected inventory of wastes to be disposed of at the facility over the operational life of the facility.	See Q. above.
(2) Disposal Facility Closure. Closure of a disposal facility shall occur within a five-year period after it is filled to capacity, or after the facility is otherwise determined to be no longer needed.	See Q. above.
(a) Prior to facility closure, the final inventory of the low-level waste disposed in the facility shall be prepared and incorporated in the performance assessment and composite analysis which shall be updated to support the closure of the facility.	See Q. above.
(b) A final closure plan shall be prepared based on the final inventory of waste disposed in the facility, the plan implemented, and the updated performance assessment and composite analysis prepared in support of the facility closure.	See Q. above.
(c) Institutional control measures shall be integrated into land use and stewardship plans and programs, and shall continue until the facility can be released pursuant to DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(d) The location and use of the facility shall be filed with the local authorities responsible for land use and zoning.	See Q. above.
R. <u>Monitoring</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(7)].	DOE Manual 435.1-1 §I.1.E(7) applies to field element managers.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(1) All Waste Facilities. Parameters that shall be sampled or monitored, at a minimum, include: temperature, pressure (for closed systems), radioactivity in ventilation exhaust and liquid effluent streams, and flammable or explosive mixtures of gases. Facility monitoring programs shall include verification that passive and active control systems have not failed.</p> <p>From DOE G 435.1-1 Chapter IV: The minimum parameters specified in the requirement were selected based on their potential significance for anticipating and identifying undesirable conditions at low-level waste management facilities. Each facility's radioactive waste management basis should include an evaluation of the applicability and significance of the minimum parameters. This evaluation also needs to consider additional parameters to be sampled or monitored to ensure the protection of the public health, the environment, and the workers. If a minimum parameter specified in the requirement is deemed to be not applicable in any way to the active operation of that facility, then that justification should be included in the radioactive waste management basis and when approved constitutes an exemption to the manual.</p> <p>Verification activities are part of the radioactive waste management basis as a condition for operation and documented appropriately.</p> <p>Compliance with this requirement is demonstrated if monitoring or sampling for the stated parameters is performed for all facilities with a precision, accuracy, and frequency consistent with timely identification of developing problems and a justification exists in the approved radioactive waste management basis for those specified parameters which are not monitored or sampled.</p>	<p>Monitoring requirements at INL radioactive waste management facilities are tailored for the specific facility to enable timely indication of developing problems. Existing radiological control procedures and assessments are followed/completed to monitor waste facilities.</p> <p>LRD-15001 and MCP-139 specify methods and frequency of radiological control surveys of all radiological areas. MCP-139 specifies the use of Form 441.A34. This form is referred to as the "routine sheet" and is to be used by facility radiological control foremen to list radiological areas that are to be surveyed, the survey periods, and methods.</p>
(2) Liquid Waste Storage Facilities. For facilities storing liquid low-level waste, the following shall also be monitored: liquid level and/or waste volume, and significant waste chemistry parameters.	NA; liquid LLW is not stored in this facility.
(3) Disposal Facilities. A preliminary monitoring plan for a low-level waste disposal facility shall be prepared and submitted to Headquarters for review with the performance assessment and composite analysis. The monitoring plan shall be updated within one year following issuance of the disposal authorization statement to incorporate and implement conditions specified in the disposal authorization statement.	NA; this facility does not dispose of LLW.
(a) The site-specific performance assessment and composite analysis shall be used to determine the media, locations, radionuclides, and other substances to be	See (3) above.

Table 4. (continued).

Facility Name: IF-603, Laboratory 103	
Chapter IV, LLW Requirements	Facility Compliance Information
monitored.	
(b) The environmental monitoring program shall be designed to include measuring and evaluating releases, migration of radionuclides, disposal unit subsidence, and changes in disposal facility and disposal site parameters which may affect long-term performance.	See (3) above.
(c) The environmental monitoring programs shall be capable of detecting changing trends in performance to allow application of any necessary corrective action prior to exceeding the performance objectives in this Chapter.	See (3) above.

4.5 IF-611, Laboratory 105

1. **Facility description:** IF-611 is a 4,528 gross ft², steel-framed, insulated, metal panel building that houses four nearly equal sized laboratories. These laboratories consist of a materials laboratory, an electronics laboratory, an optics/physics laboratory, and a clean room chemistry laboratory. Laboratory space totals 3,042 ft², one hard wall office of 143 ft², and building service space of 630 ft². The balance of the space is consumed with service functions.

The strength of the laboratory is its ability to provide ultra-trace chemical separations and ultra-trace measurements and to prepare ultra-trace radioactive standards in a cleanroom environment. This work must be conducted at locations as far removed as reasonably achievable with respect to sources of actinides such as the Idaho Nuclear Technology and Engineering Center, the Radioactive Waste Management Complex, Test Area North, and the Advanced Test Reactor Complex. In addition to its distance from such sources, IF-611, Laboratory 105 has been selected for two other reasons:

(1) occasionally this work supports classified programs that benefit from the security procedures already in place at INL and (2) this work requires the cleanroom already in place in that laboratory.

2. **Hazard category:** LTHC3 radiological
3. **Radioactive waste managed at this facility:** Routine contact-handled LLW and mixed LLW is generated and staged at this facility

NOTE: Although current Laboratory 105 process operations do not include elementary neutralization, the facility has the capability to perform containerized elementary neutralization as provided by LWP-8000, "Environmental Instructions for Facilities, Processes, Materials and Equipment." BEA officials requested that the RWMB reflect this capability. Therefore, the Table 5 compliance information features an entry at requirement D.(2) addressing the treatment facilities requirements and states that this facility is not a treatment facility although the elementary neutralization capability is present if needed.

4. **RWMB documents/programs:**

- a) Safety basis/hazard analysis:
 - EDF-7862, "Hazard Classification for the INL Research Center (IRC)"
- b) Laboratory-wide:
 - Form 441.A34, "INL Radiological Control Required Surveys"

- LI-435, “Waste Management Routine Field Activities”
- LRD-15001, “Radiological Control Manual”
- LWP-8000, “Environmental Instructions for Facilities, Processes, Materials and Equipment”
- LWP-13840, “Management of Issues, Observations, and Noteworthy Practices”
- LWP-14002, “Timeout and Stop Work Authority”
- LWP-15011, “Radioactive Material Areas and Radioactive Storage Areas”
- LWP-17000, “Waste Management”
- MCP-139, “Radiological Surveys”
- MCP-17000, Rev.1, “Waste Generator Services Waste Management”
- MCP-17410, “Management of Waste Storage Areas”
- MCP-17500, “Waste Generator Services Certification of Waste Shipments to the Nevada Test Site”
- PDD-17000, “Waste Management Program”
- PLN-114, “INL Emergency Plan/RCRA Contingency Plan”
- PLN-522, “Quality Assurance Program Plan for the Waste Management/Waste Certification Program”

c) Facility-specific:

- 1456-08-REC, “General Purpose Ultratrace Analytical Chemistry”
- 1507-08-SAF, “Determination of Ultratrace Levels of Iodine”

LLW is managed at this facility. Table 5 presents the facility compliance information for Chapter IV, “Low-level Waste Requirements.”

Table 5. IF-611, Laboratory 105, DOE Manual 435.1-1 low-level waste requirements and facility compliance information.

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>A. <u>Definition of Low-Level Waste</u>. Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the <i>Atomic Energy Act of 1954</i>, as amended), or naturally occurring radioactive material.</p> <p>(From DOE G 435.1-1 Chapter IV: Low-level radioactive waste is defined by what it is not. The guidance on definitions in Chapters II and III should be consulted first for making a determination on how to properly manage a suspect waste stream.)</p>	<p>This requirement provides the criteria for determining which DOE radioactive waste is to be managed as LLW in accordance with DOE Manual 435.1-1, Chapter IV.</p> <p>Radioactive waste managed at this facility under the requirements of this chapter is not managed under the requirements of DOE Manual 435.1-1, Chapter II or Chapter III.</p>
<p>B. <u>Management of Specific Wastes</u>. The following provide for management of specific wastes as low-level waste in accordance with the requirements in this Chapter:</p>	<p>See (1), (2), (3), (4) below.</p>

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
(1) Mixed Low-Level Waste. Low-level waste determined to contain both source, special nuclear, or byproduct material subject to the <i>Atomic Energy Act of 1954</i> , as amended, and a hazardous component subject to the <i>Resource Conservation and Recovery Act</i> (RCRA), as amended, shall be managed in accordance with the requirements of RCRA and DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	This facility manages mixed LLW in SAAs. Management of SAAs is addressed in MCP-17410 and overall management of mixed waste is addressed in MCP-17000.
(2) TSCA-Regulated Waste. Low-level waste containing polychlorinated biphenyls, asbestos, or other such regulated toxic components shall be managed in accordance with requirements derived from the <i>Toxic Substances Control Act</i> , as amended, DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	NA; this facility does not manage TSCA-regulated waste.
(3) Accelerator-Produced Waste. Radioactive waste produced as a result of operations of DOE accelerators is low-level waste and shall be managed in accordance with DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual, and all applicable Federal or State requirements.	NA; this facility does not manage accelerator-produced waste.
(4) 11e.(2) and Naturally Occurring Radioactive Material. Small quantities of 11e.(2) byproduct material and naturally occurring radioactive material may be managed as low-level waste provided they can be managed to meet the requirements for low-level waste disposal in Section IV.P of this Manual.	NA; this facility does not manage naturally occurring radioactive material.
C. <u>Complex-Wide Low-Level Waste Management Program</u> . A complex-wide program and plan shall be developed as described under <i>Responsibilities</i> , 2.B and 2.D, in Chapter I of this Manual.	Not a facility-specific requirement. DOE Manual 435.1-1 §I.2.B and §I.2.D apply to the Assistant Secretary for Environmental Management and the Deputy Assistant Secretary for Waste Management, respectively.
D. <u>Radioactive Waste Management Basis</u> . Low-level waste facilities, operations, and activities shall have a radioactive waste management basis consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment. The following specific waste management controls shall be part of the radioactive waste management basis:	The RWMB provides the regulatory framework for management of radioactive waste at INL. It specifically identifies facility management and implementing documents for the generation, storage, treatment, and disposal of radiological waste.
(1) Generators. The waste certification program. From DOE G 435.1-1 Chapter IV: For a facility that generates low-level waste, the radioactive waste management basis is to include the program for certifying that waste meets the waste acceptance requirements of the facility(ies) to which the waste will be sent.	See J. below for waste certification program requirements. EDF-7862 establishes laboratory facilities at the IF-603 facility as LTHC3 facilities.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(2) Treatment Facilities. certification program. The waste acceptance requirements and the waste [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	<p>NA; LLW is not treated at this facility.</p> <p>Containerized elementary neutralization is performed at this facility as provided by LWP-8000. As stated in §4.118, elementary neutralization of corrosive hazardous waste may take place at any location where waste is generated or stored and neither a generator treatment plan nor a permit is required. Solidification of liquid LLW for the purpose of staging (not for treating the radioactive constituents) also may be performed. Therefore, this facility is not considered to be a treatment facility.</p>
<p>(3) Storage Facilities. The waste acceptance requirements and the waste certification program.</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	<p>NA; this facility stages waste in accordance with N.(7) to facilitate treatment or disposal.</p>
<p>(4) Disposal Facilities. The performance assessment, composite analysis, disposal authorization statement, closure plan, waste acceptance requirements, and</p>	<p>NA; this facility is not a disposal facility.</p>

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
monitoring plan.	
E. <u>Contingency Actions</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(5)].	DOE Manual 435.1-1 §I.1.E(5) addresses the sitewide emergency management system. The INL plan is provided in PLN-114.
<p>(1) Contingency Storage. For off-normal or emergency situations involving high activity or high hazard liquid low-level waste storage or treatment, spare capacity with adequate capabilities shall be maintained to receive the largest volume of liquid contained in any one storage tank or treatment facility. Tanks or other facilities that are designated low-level waste contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store liquid LLW.
<p>(2) Transfer Equipment. Pipelines and auxiliary facilities necessary for the transfer of high activity or high hazard liquid low-level waste to contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store or treat liquid LLW.
<p>F. <u>Corrective Actions</u>. I of this Manual. The following requirements are in addition to those in Chapter [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with DOE M 435.1-1 §I.2.G.(1) is demonstrated by records</p>	The INL-wide procedure addressing problem identification as required by DOE Manual 435.1-1 §I.2.G.(1) is LWP-13840, which implements the laboratory's corrective action system.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>showing what corrective actions were taken to remedy situations in the radioactive waste management system.</p> <p>Compliance with DOE M 435.1-1 §I.2.G.(2) is demonstrated by having the necessary procedures, mechanisms, and training in place to effect shutdown or curtailment of activities which pose an imminent danger or other serious hazard to workers or the public, or are not protective of the environment.</p>	<p>The INL-wide procedure addressing shutdown or curtailment of activities as required by DOE Manual 435.1-1 §I.2.G.(2) is LWP-14002.</p>
<p>(1) Order Compliance. Corrective actions shall be implemented whenever necessary to ensure the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual are met.</p> <p>From DOE G 435.1-1 Chapter IV: If a facility or activity can be allowed to operate while a noncompliant or hazardous condition exists, the allowance and any associated limitations must be defined as part of the facility or activity's radioactive waste management basis, identified as a configuration controlled item in a configuration management plan or included in a revision or modification to an operating procedure or similar controlled documentation.</p> <p>Compliance with this requirement is demonstrated if a corrective action system addresses noncompliant or hazardous situations involving low-level waste management facilities in a systematic fashion, and allows identification of problems by all personnel.</p>	<p>See F. above.</p>
<p>(2) Operations Curtailment. Operations shall be curtailed or facilities shut down for failure to establish, maintain, or operate consistent with an approved radioactive waste management basis.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated with a documented system of routine assessments to determine whether waste management activities and facilities are operating in accordance with an approved radioactive waste management basis that provides for graded limitations that can be placed on activities and operations that do not have, or are operating outside of, an approved radioactive waste management basis, including shutdown of the facility.</p>	<p>The approved RWMB establishes the current compliance status at each radioactive waste management facility. Facility assessments are scheduled to ensure waste management activities are conducted in accordance with the approved RWMB.</p>
<p>G. <u>Waste Acceptance</u>. The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(6)].</p>	<p>DOE Manual 435.1-1 §I.2.F(6) applies to field element managers.</p>
<p>(1) Technical and Administrative. Waste acceptance requirements for all low-level waste storage, treatment, or disposal facilities, operations, and activities shall specify, at a minimum, the following:</p>	<p>NA; this facility does not accept LLW from other facilities.</p>

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
From DOE G 435.1-1 Chapter IV: Compliance with these waste acceptance requirements is demonstrated if they are documented, contain clear and precise criteria specifying the radionuclide limits in the form of contents or concentrations that can be accepted, the limitations and prohibitions on waste forms and packages that can be received, and the limits, prohibitions, or instructions concerning any other technical information so that the waste is compatible with the safety basis of the facility, and which will result in acceptable waste at subsequent steps in managing the low-level waste.	
(a) Allowable activities and/or concentrations of specific radionuclides.	See (1) above.
(b) Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal.	See (1) above.
(c) Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance.	See (1) above.
(d) The following are additional waste acceptance requirements that shall be specified in low-level waste disposal facility waste acceptance requirements:	See (1) above.
1 Low-level waste must contribute to and not detract from achieving long-term stability of the facility, minimizing the need for long-term active maintenance, minimizing subsidence, and minimizing contact of water with waste. Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical.	See (1) above.
2 Liquid low-level waste or low-level waste containing free liquid must be converted into a form that contains as little freestanding liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the waste volume when the low-level waste is in a disposal container, or 0.5 percent of the waste volume after it is processed to a stable form.	See (1) above.
3 Low-level waste must not be readily capable of detonation or of explosive decomposition or reaction at anticipated pressures and temperatures, or of explosive reaction with water. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.	See (1) above.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
4 Low-level waste must not contain, or be capable of generating by radiolysis or biodegradation, quantities of toxic gases, vapors, or fumes harmful to the public or workers or disposal facility personnel, or harmful to the long-term structural stability of the disposal site.	See (1) above.
5 Low-level waste in a gaseous form must be packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20 C. [sic]	See (1) above.
<p>(e) The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.</p> <p>From DOE G 435.1-1 Chapter IV: Waste acceptance requirements are acceptable if they are documented and contain a clear description of the procedure and bases for obtaining an exception or deviation to the acceptance criteria for low-level waste to be received at the facility.</p>	See (1) above.
<p>(2) Evaluation and Acceptance. The receiving facility shall evaluate waste for acceptance, including confirmation that the technical and administrative requirements have been met. A process for the disposition of non-conforming wastes shall be established.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the waste acceptance requirements for a low-level waste management facility is demonstrated if they include a process for evaluation and acceptance of incoming waste to ensure the acceptance criteria of the facility receiving the waste are met that includes one of or a combination of: (1) testing, sampling, and analysis of representative samples of waste upon receipt; (2) testing, sampling, and analysis of split samples of waste taken at the generator site; (3) evaluation of testing, sampling, and analysis of data provided by the generator, or (4) audits, reviews, surveillance, or observations of generator waste certification programs and characterization activities. Additionally, acceptable waste acceptance requirements for a storage, treatment or disposal facility will have documented procedures and actions to be taken if a waste that does not conform to the waste acceptance criteria is received at the facility.</p>	See (1) above.
H. <u>Waste Generation Planning</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(7)].	DOE Manual 435.1-1 §I.2.F(7) applies to field element managers.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(1) Life-Cycle Planning. Prior to waste generation, planning shall be performed to address the entire life cycle for all low-level waste streams.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this planning requirement is demonstrated by the individual sites establishing a process for evaluating the life-cycle of low-level waste prior to its generation, including the identification of low-level wastes with no path to disposal and appropriate records justifying the newly generated low-level waste stream(s), and site personnel possessing planning information showing the location(s) where low-level waste will be stored, treated, and/or disposed along with a confirmation that the personnel managing the facilities agree that the low-level waste may be managed at those facilities.</p>	<p>PDD-17000 and LWP-17000 provide direction to the waste generators for waste generation planning to address the entire life cycle.</p>
<p>(2) Waste with No Identified Path to Disposal. Low-level waste streams with no identified path to disposal shall be generated only in accordance with approved conditions which, at a minimum, shall address:</p>	<p>This facility is not generating radioactive waste that does not have an identified path to disposal.</p>
<p>(a) Programmatic need to generate the waste;</p>	<p>See (2) above.</p>
<p>(b) Characteristics and issues preventing the disposal of the waste;</p>	<p>See (2) above.</p>
<p>(c) Safe storage of the waste until disposal can be achieved; and</p>	<p>See (2) above.</p>
<p>(d) Activities and plans for achieving final disposal of the waste.</p>	<p>See (2) above.</p>
<p>I. <u>Waste Characterization</u>. Low-level waste shall be characterized using direct or indirect methods, and the characterization documented in sufficient detail to ensure safe management and compliance with the waste acceptance requirements of the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program for documenting and the existence of records that document the process for acquiring and verifying the validity of low-level waste characterization data acquired through the use of direct or indirect methods.</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.</p> <p>Laboratory Instruction 1456-08-REC, Table 2.03 and Laboratory Instruction 1507-08-SAF, Table 2.1 provide very general characterization information regarding the waste types and volumes generated subsequent to routine laboratory operations. The table also provides the method of disposal.</p>
<p>(1) Data Quality Objectives. The data quality objectives process, or a comparable process, shall be used for identifying characterization parameters and acceptable uncertainty in characterization data.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the documented use of a data quality objectives or a comparable process</p>	<p>Radioactive waste management facilities characterize waste in accordance with the requirements of the receiving storage, treatment, or disposal facility. The documented use of a data quality objectives process, or comparable process, was not identified for this facility.</p>

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
for determining the type, quantity, and quality of characterization data needed to safely manage low-level waste.	
<p>(2) Minimum Waste Characterization. Characterization data shall, at a minimum, include the following information relevant to the management of the waste:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the existence of a program or procedure for determining and records that document characterization of low-level waste consistent with the minimum characterization data requirements.</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.</p> <p>Laboratory Instruction 1456-08-REC, Table 2.03 and Laboratory Instruction 1507-08-SAF, Table 2.1 provide very general characterization information regarding the waste types and volumes generated subsequent to routine laboratory operations. The table also provides the method of disposal.</p>
(a) Physical and chemical characteristics;	See (2) above.
(b) Volume, including the waste and any stabilization or absorbent media;	See (2) above.
(c) Weight of the container and contents;	See (2) above.
(d) Identities, activities, and concentrations of major radionuclides;	See (2) above.
(e) Characterization date;	See (2) above.
(f) Generating source; and	See (2) above.
(g) Any other information which may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives.	See (2) above.
<p>J. <u>Waste Certification</u>. A waste certification program shall be developed, documented, and implemented to ensure that the waste acceptance requirements of facilities receiving low-level waste for storage, treatment, and disposal are met.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the development and documentation portion of the certification requirement is demonstrated by a waste certification plan that identifies the organizations involved, assigns responsibilities for implementing the program, and describes or references the quality assurance, training, procurement controls, records management, and procedures to be used by the program. Acceptable performance for implementing the program is demonstrated when appropriate personnel are trained and follow the procedures that govern their part of the waste certification. Additionally, acceptable performance is demonstrated if the waste certification plan and procedures are current and controlled in accordance with a document controls program, and records related to certification</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste certification information.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p> <p>Container procurement is addressed in MCP-17000 §4.6.</p> <p>Waste certification is performed and tracked using IWTS. Documentation of the IWTS Program is available electronically only.</p> <p>PLN-522 requires waste technical specialists and waste disposition specialists to complete the appropriate training/qualification before being granted approval authority for profiles within the IWTS Program. The waste certification official, alternate waste certification official, and NNSS packaging certifiers must complete the appropriate training/qualifications to disposition waste to NNSS.</p>

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
(e.g., certification statements, training records, procurement records, characterization records, container records) are generated and managed in accordance with the established site program.	
<p>(1) Certification Program. The waste certification program shall designate the officials who have the authority to certify and release waste for shipment; and specify what documentation is required for waste generation, characterization, shipment, and certification. The program shall provide requirements for auditability, retrievability, and storage of required documentation and specify the records retention period.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure for record keeping and records showing that low-level waste is certified as having met the waste acceptance criteria of the facility to which it was transferred and that the certification statement is supported by additional records regarding the waste source, characterization, and container.</p>	See J. above.
<p>(2) Certification before Transfer. Low-level waste shall be certified as meeting waste acceptance requirements before it is transferred to the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the presence of a certification program which includes procedures requiring a signed certification statement prior to the release of waste for transfer, and by dated records showing that waste was certified before being transferred.</p>	See J. above.
<p>(3) Maintaining Certification. Low-level waste that has been certified as meeting the waste acceptance requirements for transfer to a storage, treatment, or disposal facility shall be managed in a manner that maintains its certification status.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure reflecting this requirement is present and site personnel are able to show that the storage of low-level waste containers is in a facility or manner where the containers would not be damaged by normal weather events, and cannot be accessed by unauthorized personnel. Further, each container can be traced to its certification and the information supporting that certification.</p>	See J. above.
K. <u>Waste Transfer</u> . A documented process shall be established and implemented for transferring	MCP-17000 specifies the requirements for preparing an IWTS profile that captures waste certification data,

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>responsibility for management of low-level waste and for ensuring availability of relevant data. The following requirements are in addition to those in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if facilities have procedures for the receipt of waste and the transfer of waste, as appropriate, which address the acquisition of waste and container data and the transfer of ownership, respectively. Further evidence of acceptable performance is facility records showing that data on the waste containers is available and accurate, and that documented transfer of responsibility occurs.</p>	<p>transfer information, and associated authorizations.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p>
<p>(1) Authorization. Low-level waste shall not be transferred to a storage, treatment, or disposal facility until personnel responsible for the facility receiving the waste authorize the transfer.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by sites having procedures that require a confirmation of authorization before releasing waste for transfer, and records showing that transfers are made in accordance with written authorizations.</p>	See K. above.
<p>(2) Data. Waste characterization data, container information, and generation, storage, treatment, and transportation information for low-level waste shall be transferred with or be traceable to the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if there are procedures requiring that characterization and container data be provided and maintained for each low-level waste transfer and documented records of transfers show that the information is being provided.</p>	See K. above.
<p><u>L. Packaging and Transportation.</u> The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(11)].</p>	DOE Manual 435.1-1 §I.1.E(11) applies to field element managers.
<p>(1) Packaging. If containers are used:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the packaging requirement is demonstrated by: (1) procedures which document proper packaging protocols; and (2) no trends of routine repackaging of low-level waste that is packaged after issuance of DOE O 435.1. Successful performance of this requirement is also demonstrated by a record of containers for which failure has not routinely occurred under management conditions. It is recognized that there may be failed containers for waste previously placed in storage. For</p>	MCP-17000 §4. addresses packaging requirements.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
those containers, the goal is to only have to repackage the waste one time after it is retrieved and characterized. Further, acceptable performance is demonstrated by containers of waste having marking and labeling that allows correlation with waste characterization data and container information.	
(a) Low-level waste shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	See (1) above.
(b) When waste is packaged, vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container.	See (1) above.
(c) Containers of low-level waste shall be marked such that their contents can be identified.	See (1) above.
(2) Transportation. To the extent practical, the volume of waste and number of low-level waste shipments shall be minimized. From DOE G 435.1-1 Chapter IV: Compliance with this requirement can be demonstrated by a combination of site procedures directing the efficient use of waste container capacity and documentation showing that low-level waste shipments are systematically planned and optimized to the extent practical.	NA; waste is not shipped to an offsite facility for final disposition from this facility.
M. <u>Site Evaluation and Facility Design</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this requirement addresses new radioactive waste management facilities.
(1) Site Evaluation. Proposed locations for low-level waste facilities shall be evaluated to identify relevant features that should be avoided or must be considered in facility design and analyses.	See M. above.
(a) Each site proposed for a new low-level waste facility or expansion of an existing low-level waste facility shall be evaluated considering environmental characteristics, geotechnical characteristics, and human activities, including for a low-level waste disposal facility, the capability of the site to demonstrate, at a minimum, whether it is:	See M. above.
1 Located to accommodate the projected volume of waste to be received;	See M. above.
2 Located in a flood plain, a tectonically active area, or in the zone of water table fluctuation; and	See M. above.
3 Located where radionuclide migration pathways are	See M. above.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
predictable and erosion and surface runoff can be controlled.	
(b) Proposed sites with environmental characteristics, geotechnical characteristics, and human activities for which adequate protection cannot be provided through facility design shall be deemed unsuitable for the location of the facility.	See M. above.
(c) Low-level waste disposal facilities shall be sited to achieve long-term stability and to minimize, to the extent practical, the need for active maintenance following final closure.	See M. above.
(2) Low-Level Waste Treatment and Storage Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	See M. above.
1 Design of low-level waste treatment and storage facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a non-flammable and nonexplosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Consideration of Decontamination and Decommissioning. Areas in new and modifications to existing low-level waste management facilities that are subject to contamination with radioactive or other hazardous materials shall be designed to facilitate decontamination. For such facilities a proposed decommissioning method or a conversion method leading to reuse shall be described.	See M. above.
(d) Instrumentation and Control Systems. Engineering controls shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide volume inventory data and to prevent spills, leaks, and overflows from tanks or confinement systems.	See M. above.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
(e) Monitoring. Monitoring and/or leak detection capabilities shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide rapid identification of failed confinement and/or other abnormal conditions.	See M. above.
(3) Low-Level Waste Disposal Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	
1 Design of low-level waste disposal facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a nonflammable and non-explosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Stability. Low-level waste disposal facilities shall be designed to achieve long-term stability and to minimize to the extent practical, the need for active maintenance following final closure.	See M. above.
(d) Control of Water. Low-level waste disposal facilities shall be designed to minimize to the extent practical, the contact of waste with water during and after disposal.	See M. above.
N. <u>Storage and Staging</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(13)].	DOE Manual 435.1-1 §I.2.F(13) applies to field element managers.
(1) Storage Prohibitions. Low-level waste in storage shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water. Prior to storage, pyrophoric materials shall be treated, prepared, and packaged to be nonflammable. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by having waste	NA; this facility does not store LLW.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
acceptance requirements which prohibit low-level waste that is ignitable or explosive from being accepted for storage unless it has been treated, and procedures for properly preparing such materials for safe storage.	
<p>(2) Storage Limit. Low-level waste that has an identified path to disposal shall not be stored longer than one year prior to disposal, except for storage for decay, or as otherwise authorized by the Field Element Manager.</p> <p>From DOE G 435.1-1 Chapter IV: Storage longer than one year can be justified if the conditions for such storage are approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Storage for radioactive decay for a period greater than 1 year for waste that has an identified path to disposal is allowed. Adequate justification and the supporting information for storage for decay is to be documented in the radioactive waste management basis for the facility in which the storage will take place.</p> <p><u>Mixed waste.</u> Under the Federal Facility Compliance Act of 1992, DOE sites were required to develop Site Treatment Plans to bring stored mixed low-level waste into compliance with these requirements. The Site Treatment Plan needs to be consulted and any mixed low-level waste stored for the purpose of accumulation to facilitate treatment must meet Resource Conservation and Recovery Act storage requirements. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement and include appropriate provisions in the radioactive waste management basis for the facility in which it is stored.</p> <p><u>Legacy waste.</u> As discussed above, the intention of the requirement is not to force malicious compliance or heroic actions which would result in increased risk or safety concerns. Rather, the intention is that waste in storage longer than one year receives additional attention to ensure that the public, the workers, and the environment are protected from the hazards of the waste, and that progress is being made to dispose of the waste. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement:</p> <p>1) the radioactive waste management basis allows for</p>	NA; this facility does not store LLW. See N. (7) below for staging requirements.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>storage for no more than one year.</p> <p>2) the radioactive waste management basis allows for storage for no more than one year, or for storage for decay only for periods greater than a year, which are specified on a radionuclide basis.</p> <p>3) the radioactive waste management basis allows for storage for more than one year, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>4) the radioactive waste management basis allows for storage for decay (with specifics) and for storage for more than one year for other low-level waste, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>Compliance with this requirement is demonstrated by the existence of a radioactive waste management basis for the storage facility approved by the Field Element Manager that includes the time frames that waste are allowed to be stored, the necessary justifications for storage for decay, and the necessary technical evaluations if storage is to extend significantly beyond the one-year time frame.</p>	
<p>(3) Storage Integrity. Low-level waste shall be stored in a location and manner that protects the integrity of waste for the expected time of storage and minimizes worker exposure.</p> <p>From DOE G 435.1-1 Chapter IV: However, in making a decision to use a facility for storage and in developing a radioactive waste management basis for the activity, particular attention to protection of workers is needed.</p> <p>Compliance with this requirement is demonstrated if sites have storage capabilities for low-level waste that provide protection to waste containers so that their integrity will not be damaged through physical or chemical (corrosion) processes and that keep personnel from spending extended periods of time in the areas where low-level waste is stored.</p>	<p>NA; this facility does not store LLW. See N. (7) below for staging requirements.</p>
<p>(4) Waste Characterization for Storage.</p>	<p>NA; this facility does not store LLW. See N. (7) below</p>

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
	for staging requirements.
(a) Low-level waste that does not have an identified path to disposal shall be characterized as necessary to meet the data quality objectives and minimum characterization requirements of this Chapter, to ensure safe storage, and to facilitate disposal.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(b) Characterization information for all low-level waste in storage shall be maintained as a record in accordance with the requirements for Records Management in Chapter I of this Manual. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by documented procedures for managing waste characterization and container information on low-level waste as a Federal record. The records are managed per the applicable policies and procedures for records management referenced in DOE O 200.1 and established at the applicable Field Element.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(5) Container Inspection. A process shall be developed and implemented for inspecting and maintaining containers of low-level waste to ensure container integrity is not compromised. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by: (1) a documented process for waste container inspection and maintenance; and (2) documentation for all waste container inspections and maintenance actions performed.	LI-435 requires quarterly inspections of radioactive waste containers if waste is stored outdoors or has been in storage for greater than 1 year.
(6) Storage Management. Low-level waste storage shall be managed to identify and segregate low-level waste from mixed low-level waste.	NA; this facility does not store LLW. See N. (7) below for staging requirements.
(7) Staging. Staging of low-level waste shall be for the purpose of the accumulation of such quantities of waste as necessary to facilitate transportation, treatment, and disposal. Staging longer than 90 days shall meet the requirements for storage above and in Chapter I of this Manual. From DOE G 435.1-1 Chapter IV: The staging of low-level waste needs to be addressed in the radioactive waste management basis for the facility that is performing the staging. Generators, treatment facilities, and disposal facilities that stage waste must ensure that the action of staging is included and authorized as part of their radioactive waste management basis for the affected facilities, operations, or activities. Staging longer than 90 days must be justified, the	Routine LLW, such as personnel protective equipment, is accumulated at this facility for disposal. MCP-17000, Appendix F, "Container Start Date and Storage Prohibitions," restricts staging LLW to 90 days maximum at any generator or treatment facility prior to acceptance by a storage facility. As stated in DOE Guide 435.1-1 §IV.N.(7), staging waste in accordance with this requirement allows waste to be accumulated without being considered storage and being bound by the associated storage requirements.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>conditions for such storage met, and these practices approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Compliance with this requirement is demonstrated by a staging program that limits the temporary storage of waste to only circumstances allowed in the requirement, including justifications for any staging that exceeds the 90-day period, which is documented in the radioactive waste management basis for the facility.</p>	
<p>O. <u>Treatment</u>. Low-level waste treatment to provide more stable waste forms and to improve the long-term performance of a low-level waste disposal facility shall be implemented as necessary to meet the performance objectives of the disposal facility.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated when a treatment facility or process ensures that treated waste will meet the minimum waste form requirements of DOE M 435.1 and meet additional disposal facility-specific waste acceptance requirements for additional stability or long-term performance of facilities that will receive the treated waste.</p>	NA; this facility does not treat LLW.
<p>P. <u>Disposal</u>. Low-level waste disposal facilities shall meet the following requirements.</p>	NA; this facility does not dispose of LLW.
<p>(1) Performance Objectives. Low-level waste disposal facilities shall be sited, designed, operated, maintained, and closed so that a reasonable expectation exists that the following performance objectives will be met for waste disposed of after September 26, 1988:</p>	See P. above.
<p>(a) Dose to representative members of the public shall not exceed 25 mrem (0.25 mSv) in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air.</p>	See P. above.
<p>(b) Dose to representative members of the public via the air pathway shall not exceed 10 mrem (0.10 mSv) in a year total effective dose equivalent, excluding the dose from radon and its progeny.</p>	See P. above.
<p>(c) Release of radon shall be less than an average flux of 20 pCi/m²/s (0.74Bq/m²/s) at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/l (0.0185 Bq/l) of air may be applied at the boundary of the facility.</p>	See P. above.
<p>(2) Performance Assessment. A site-specific radiological performance assessment shall be prepared and maintained for DOE low-level waste disposed of after September 26, 1988. The performance assessment shall include calculations for a 1,000 year period after</p>	See P. above.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
closure of potential doses to representative future members of the public and potential releases from the facility to provide a reasonable expectation that the performance objectives identified in this Chapter are not exceeded as a result of operation and closure of the facility.	
(a) Analyses performed to demonstrate compliance with the performance objectives in this Chapter, and to establish limits on concentrations of radionuclides for disposal based on the performance measures for inadvertent intruders in this Chapter shall be based on reasonable activities in the critical group of exposed individuals. Unless otherwise specified, the assumption of average living habits and exposure conditions in representative critical groups of individuals projected to receive the highest doses is appropriate. The likelihood of inadvertent intruder scenarios may be considered in interpreting the results of the analyses and establishing radionuclide concentrations, if adequate justification is provided.	See P. above.
(b) The point of compliance shall correspond to the point of highest projected dose or concentration beyond a 100 meter buffer zone surrounding the disposed waste. A larger or smaller buffer zone may be used if adequate justification is provided.	See P. above.
(c) Performance assessments shall address reasonably foreseeable natural processes that might disrupt barriers against release and transport of radioactive materials.	See P. above.
(d) Performance assessments shall use DOE-approved dose coefficients (dose conversion factors) for internal and external exposure of reference adults.	See P. above.
(e) The performance assessment shall include a sensitivity/uncertainty analysis.	See P. above.
(f) Performance assessments shall include a demonstration that projected releases of radionuclides to the environment shall be maintained as low as reasonably achievable (ALARA).	See P. above.
(g) For purposes of establishing limits on radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts to water resources.	See P. above.
(h) For purposes of establishing limits on the concentration of radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts calculated for a hypothetical person assumed to inadvertently intrude for a temporary period into the low-level waste disposal	See P. above.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
facility. For intruder analyses, institutional controls shall be assumed to be effective in deterring intrusion for at least 100 years following closure. The intruder analyses shall use performance measures for chronic and acute exposure scenarios, respectively, of 100 mrem (1 mSv) in a year and 500 mrem (5 mSv) total effective dose equivalent excluding radon in air.	
(3) Composite Analysis. For disposal facilities which received waste after September 26, 1988, a site-specific radiological composite analysis shall be prepared and maintained that accounts for all sources of radioactive material that may be left at the DOE site and may interact with the low-level waste disposal facility, contributing to the dose projected to a hypothetical member of the public from the existing or future disposal facilities. Performance measures shall be consistent with DOE requirements for protection of the public and environment and evaluated for a 1,000 year period following disposal facility closure. The composite analysis results shall be used for planning, radiation protection activities, and future use commitments to minimize the likelihood that current low-level waste disposal activities will result in the need for future corrective or remedial actions to adequately protect the public and the environment.	See P. above.
(4) Performance Assessment and Composite Analysis Maintenance. The performance assessment and composite analysis shall be maintained to evaluate changes that could affect the performance, design, and operating bases for the facility. Performance assessment and composite analysis maintenance shall include the conduct of research, field studies, and monitoring needed to address uncertainties or gaps in existing data. The performance assessment shall be updated to support the final facility closure. Additional iterations of the performance assessment and composite analysis shall be conducted as necessary during the post-closure period.	See P. above.
(a) Performance assessments and composite analyses shall be reviewed and revised when changes in waste forms or containers, radionuclide inventories, facility design and operations, closure concepts, or the improved understanding of the performance of the waste disposal facility in combination with the features of the site on which it is located alter the conclusions or the conceptual model(s) of the existing performance assessment or composite analysis.	See P. above.
(b) A determination of the continued adequacy of the performance assessment and composite analysis shall	See P. above.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
be made on an annual basis, and shall consider the results of data collection and analysis from research, field studies, and monitoring.	
(c) Annual summaries of low-level waste disposal operations shall be prepared with respect to the conclusions and recommendations of the performance assessment and composite analysis and a determination of the need to revise the performance assessment or composite analysis.	See P. above.
(5) Disposal Authorization. A disposal authorization statement shall be obtained prior to construction of a new low-level waste disposal facility. Field Elements with existing low-level waste disposal facilities shall obtain a disposal authorization statement in accordance with the schedule in the Complex-Wide Low-Level Waste Management Program Plan. The disposal authorization statement shall be issued based on a review of the facility's performance assessment, composite analysis, performance assessment and composite analysis maintenance, preliminary closure plan, and preliminary monitoring plan. The disposal authorization statement shall specify the limits and conditions on construction, design, operations, and closure of the low-level waste facility based on these reviews. A disposal authorization statement is a part of the radioactive waste management basis for a disposal facility. Failure to obtain a disposal authorization statement by the implementation date of this Order shall result in shutdown of the disposal facility.	See P. above.
(6) Disposal Facility Operations. The disposal facility design and operation must be consistent with the disposal facility closure plan and lead to disposal facility closure that provides a reasonable expectation that performance objectives will be met. Low-level waste shall be disposed in such a manner that achieves the performance objectives stated in this Chapter, consistent with the disposal facility radiological performance assessment. Additional requirements include:	See P. above.
(a) Operating procedures shall be developed and implemented for low-level waste disposal facilities that protect the public, workers, and the environment; ensure the security of the facility; minimize subsidence during and after waste emplacement; achieve long-term stability and minimize the need for long-term active maintenance; and meet the requirements of the closure/post-closure plan.	See P. above.
(b) Permanent identification markers for disposal excavations and monitoring wells shall be emplaced.	See P. above.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
(c) Low-level waste placement into disposal units shall minimize voids between waste containers. Voids within disposal units shall be filled to the extent practical. Uncontainerized bulk waste shall also be placed in a manner that minimizes voids and subsidence.	
(d) Operations are to be conducted so that active waste disposal operations will not have an adverse effect on any other disposal units.	See P. above.
(e) Operations shall include a process for tracking and documenting low-level waste placement in the facility by generator source.	See P. above.
(7) Alternate Requirements for Low-Level Waste Disposal Facility Design and Operation. Requirements other than those set forth in this Section for the design and operation of a low-level waste disposal facility may be approved on a specific basis if a reasonable expectation is demonstrated that the disposal performance objectives will be met.	See P. above.
Q. <u>Closure</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this facility does not dispose of LLW.
(1) Disposal Facility Closure Plans. A preliminary closure plan shall be developed and submitted to Headquarters for review with the performance assessment and composite analysis. The closure plan shall be updated following issuance of the disposal authorization statement to incorporate conditions specified in the disposal authorization statement. Closure plans shall:	See Q. above.
(a) Be updated as required during the operational life of the facility.	See Q. above.
(b) Include a description of how the disposal facility will be closed to achieve long-term stability and minimize the need for active maintenance following closure and to ensure compliance with the requirements of DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(c) Include the total expected inventory of wastes to be disposed of at the facility over the operational life of the facility.	See Q. above.
(2) Disposal Facility Closure. Closure of a disposal facility shall occur within a five-year period after it is filled to capacity, or after the facility is otherwise determined to be no longer needed.	See Q. above.
(a) Prior to facility closure, the final inventory of the	See Q. above.

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
low-level waste disposed in the facility shall be prepared and incorporated in the performance assessment and composite analysis which shall be updated to support the closure of the facility.	
(b) A final closure plan shall be prepared based on the final inventory of waste disposed in the facility, the plan implemented, and the updated performance assessment and composite analysis prepared in support of the facility closure.	See Q. above.
(c) Institutional control measures shall be integrated into land use and stewardship plans and programs, and shall continue until the facility can be released pursuant to DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(d) The location and use of the facility shall be filed with the local authorities responsible for land use and zoning.	See Q. above.
R. <u>Monitoring</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(7)].	DOE Manual 435.1-1 §I.1.E(7) applies to field element managers.
<p>(1) All Waste Facilities. Parameters that shall be sampled or monitored, at a minimum, include: temperature, pressure (for closed systems), radioactivity in ventilation exhaust and liquid effluent streams, and flammable or explosive mixtures of gases. Facility monitoring programs shall include verification that passive and active control systems have not failed.</p> <p>From DOE G 435.1-1 Chapter IV: The minimum parameters specified in the requirement were selected based on their potential significance for anticipating and identifying undesirable conditions at low-level waste management facilities. Each facility's radioactive waste management basis should include an evaluation of the applicability and significance of the minimum parameters. This evaluation also needs to consider additional parameters to be sampled or monitored to ensure the protection of the public health, the environment, and the workers. If a minimum parameter specified in the requirement is deemed to be not applicable in any way to the active operation of that facility, then that justification should be included in the radioactive waste management basis and when approved constitutes an exemption to the manual.</p> <p>Verification activities are part of the radioactive waste management basis as a condition for operation and documented appropriately.</p> <p>Compliance with this requirement is demonstrated if</p>	<p>Monitoring requirements at INL radioactive waste management facilities are tailored for the specific facility to enable timely indication of developing problems. Existing radiological control procedures and assessments are followed/completed to monitor waste facilities.</p> <p>LRD-15001 and MCP-139 specify methods and frequency of radiological control surveys of all radiological areas. MCP-139 specifies the use of Form 441.A34. This form is referred to as the "routine sheet" and is to be used by facility radiological control foremen to list radiological areas that are to be surveyed, the survey periods, and methods</p>

Table 5. (continued).

Facility Name: IF-611 Laboratory 105	
Chapter IV, LLW Requirements	Facility Compliance Information
monitoring or sampling for the stated parameters is performed for all facilities with a precision, accuracy, and frequency consistent with timely identification of developing problems and a justification exists in the approved radioactive waste management basis for those specified parameters which are not monitored or sampled.	
(2) Liquid Waste Storage Facilities. For facilities storing liquid low-level waste, the following shall also be monitored: liquid level and/or waste volume, and significant waste chemistry parameters.	NA; liquid LLW is not stored in this facility.
(3) Disposal Facilities. A preliminary monitoring plan for a low-level waste disposal facility shall be prepared and submitted to Headquarters for review with the performance assessment and composite analysis. The monitoring plan shall be updated within one year following issuance of the disposal authorization statement to incorporate and implement conditions specified in the disposal authorization statement.	NA; this facility does not dispose of LLW.
(a) The site-specific performance assessment and composite analysis shall be used to determine the media, locations, radionuclides, and other substances to be monitored.	See (3) above.
(b) The environmental monitoring program shall be designed to include measuring and evaluating releases, migration of radionuclides, disposal unit subsidence, and changes in disposal facility and disposal site parameters which may affect long-term performance.	See (3) above.
(c) The environmental monitoring programs shall be capable of detecting changing trends in performance to allow application of any necessary corrective action prior to exceeding the performance objectives in this Chapter.	See (3) above.

4.6 IF-657, Radioactive Waste Storage Area

1. **Facility description:** IF-657 is an 11,004-gross ft², steel-framed, metal, insulated panel facility with an attached three-sided, 410-ft² storage area. This facility is a large-scale demonstration/research facility with four high-bay spaces (about 35 ft) containing a 10-ton overhead crane (hook height is about 31 ft) and four low-bay areas (about 25 ft). The facility contains 5,680 ft² of laboratory spaces, 346 ft² of conference area, and 3,339 ft² of service area, which includes a coffee alcove, hallway, mezzanine/catwalk area, and 1,302 ft² building service areas. Currently, the primary function of IF-657 is to store REC waste prior to shipment for disposal.
2. **Hazard category:** LTHC3 radiological
3. **Radioactive waste managed at this facility:** Routine contact-handled LLW is stored at this facility
4. **RWMB documents/programs:**

- a) Safety basis/hazard analysis:
 - EDF-7862, “Hazard Classification for the INL Research Center (IRC)”
- b) Laboratory-wide:
 - Form 441.A34, “INL Radiological Control Required Surveys”
 - LI-435, “Waste Management Routine Field Activities”
 - LRD-15001, “Radiological Control Manual”
 - LWP-13840, “Management of Issues, Observations, and Noteworthy Practices”
 - LWP-14002, “Timeout and Stop Work Authority”
 - LWP-15011, “Radioactive Material Areas and Radioactive Storage Areas”
 - LWP-17000, “Waste Management”
 - MCP-139, “Radiological Surveys”
 - MCP-17000, “Waste Generator Services Waste Management”
 - MCP-17500, “Waste Generator Services Certification of Waste Shipments to the Nevada Test Site”
 - PDD-17000, “Waste Management Program”
 - PLN-114, “INL Emergency Plan/RCRA Contingency Plan”
 - PLN-522, “Quality Assurance Program Plan for the Waste Management/Waste Certification Program”
- c) Facility-specific:
 - IAG-IF-657, “Tenant Use Agreement Between Facility Management Services at the Research and Education Campus (REC) and Science and Technology Tenants at INL Research Campus (IRC) IF-657, INL Engineering Demonstration Facility (IEDF).”

LLW is managed at this facility. Table 6 presents the facility compliance information for Chapter IV, “Low-level Waste Requirements.”

Table 6. IF-657, Radioactive Waste Staging Area, DOE Manual 435.1-1 low-level waste requirements and facility compliance information.

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>A. <u>Definition of Low-Level Waste</u>. Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the <i>Atomic Energy Act of 1954</i>, as amended), or naturally occurring radioactive material.</p> <p>(From DOE G 435.1-1 Chapter IV: Low-level radioactive waste is defined by what it is not. The guidance on definitions in Chapters II and III should be consulted first for making a determination on how to properly manage a suspect waste stream.)</p>	<p>This requirement provides the criteria for determining which DOE radioactive waste is to be managed as LLW in accordance with DOE Manual 435.1-1, Chapter IV.</p> <p>Radioactive waste managed at this facility under the requirements of this chapter is not managed under the requirements of DOE Manual 435.1-1, Chapter II or Chapter III.</p>
<p>B. <u>Management of Specific Wastes</u>. The following provide for management of specific wastes as low-level waste in accordance with the requirements in this Chapter:</p>	<p>See (1), (2), (3), (4) below.</p>

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
(1) Mixed Low-Level Waste. Low-level waste determined to contain both source, special nuclear, or byproduct material subject to the <i>Atomic Energy Act of 1954</i> , as amended, and a hazardous component subject to the <i>Resource Conservation and Recovery Act</i> (RCRA), as amended, shall be managed in accordance with the requirements of RCRA and DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	NA; this facility does not manage RCRA-regulated waste.
(2) TSCA-Regulated Waste. Low-level waste containing polychlorinated biphenyls, asbestos, or other such regulated toxic components shall be managed in accordance with requirements derived from the <i>Toxic Substances Control Act</i> , as amended, DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual.	NA; this facility does not manage TSCA-regulated waste.
(3) Accelerator-Produced Waste. Radioactive waste produced as a result of operations of DOE accelerators is low-level waste and shall be managed in accordance with DOE O 435.1, <i>Radioactive Waste Management</i> , and this Manual, and all applicable Federal or State requirements.	NA; this facility does not manage accelerator-produced waste.
(4) 11e.(2) and Naturally Occurring Radioactive Material. Small quantities of 11e.(2) byproduct material and naturally occurring radioactive material may be managed as low-level waste provided they can be managed to meet the requirements for low-level waste disposal in Section IV.P of this Manual.	NA; this facility does not manage naturally occurring radioactive material.
C. <u>Complex-Wide Low-Level Waste Management Program</u> . A complex-wide program and plan shall be developed as described under <i>Responsibilities</i> , 2.B and 2.D, in Chapter I of this Manual.	Not a facility-specific requirement. DOE Manual 435.1-1 §I.2.B and §I.2.D apply to the Assistant Secretary for Environmental Management and the Deputy Assistant Secretary for Waste Management, respectively.
D. <u>Radioactive Waste Management Basis</u> . Low-level waste facilities, operations, and activities shall have a radioactive waste management basis consisting of physical and administrative controls to ensure the protection of workers, the public, and the environment. The following specific waste management controls shall be part of the radioactive waste management basis:	The RWMB provides the regulatory framework for management of radioactive waste at INL. It specifically identifies facility management and implementing documents for the generation, storage, treatment, and disposal of radiological waste.
(1) Generators. The waste certification program. From DOE G 435.1-1 Chapter IV: For a facility that generates low-level waste, the radioactive waste management basis is to include the program for certifying that waste meets the waste acceptance requirements of the facility(ies) to which the waste will be sent.	NA; LLW is not generated at this facility.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(2) Treatment Facilities. certification program. The waste acceptance requirements and the waste [sic]</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	<p>NA; LLW is not treated at this facility.</p>
<p>(3) Storage Facilities. The waste acceptance requirements and the waste certification program.</p> <p>From DOE G 435.1-1 Chapter IV: Facilities that store or treat low-level waste are to have approved waste acceptance requirements (see DOE M 435.1-1, Section IV.G) prior to the issuance of a radioactive waste management basis.</p> <p>A facility that stores or treats waste also is generally expected to have a waste certification program. Waste from these facilities will have to be certified as meeting the waste acceptance requirements of the facility to which it will be transferred, and the facilities have the potential for generating radioactive waste (e.g., secondary processing streams from treatment, monitoring and sampling, radioactive release cleanup). Consequently, storage and treatment facilities should also have an approved waste certification program as part of their radioactive waste management basis.</p> <p>As part of the radioactive waste management basis, site personnel needs to implement a system or process for tracking the waste inventory at a storage, treatment, or disposal facility.</p>	<p>See G. below for waste acceptance requirements and J. below for waste certification requirements.</p> <p>EDF-7862 establishes laboratory facilities at the IF-603 facility as LTHC3 facilities.</p>

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
(4) Disposal Facilities. The performance assessment, composite analysis, disposal authorization statement, closure plan, waste acceptance requirements, and monitoring plan.	NA; this facility is not a disposal facility.
E. <u>Contingency Actions</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(5)].	DOE Manual 435.1-1 §I.1.E(5) addresses the sitewide emergency management system. The INL plan is provided in PLN-114.
<p>(1) Contingency Storage. For off-normal or emergency situations involving high activity or high hazard liquid low-level waste storage or treatment, spare capacity with adequate capabilities shall be maintained to receive the largest volume of liquid contained in any one storage tank or treatment facility. Tanks or other facilities that are designated low-level waste contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store liquid LLW.
<p>(2) Transfer Equipment. Pipelines and auxiliary facilities necessary for the transfer of high activity or high hazard liquid low-level waste to contingency storage shall be maintained in an operational condition when waste is present and shall meet the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these requirements is demonstrated if adequate spare capacity and transfer equipment exists for emergency transfers of all high activity and high hazard liquid low-level waste. In addition, the capability to perform emergency transfers is demonstrated by having waste transfer routings identified, operational procedures to direct transfers, staff trained to the procedures, and records showing that the spare capacity and transfer capability are kept in operating condition.</p>	NA; this facility does not store or treat liquid LLW.
F. <u>Corrective Actions</u> . I of this Manual. The following requirements are in addition to those in Chapter [sic]	The INL-wide procedure addressing problem identification as required by DOE Manual 435.1-1 §I.2.G.(1) is LWP-13840, which implements the

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>From DOE G 435.1-1 Chapter IV: Compliance with DOE M 435.1-1 §I.2.G.(1) is demonstrated by records showing what corrective actions were taken to remedy situations in the radioactive waste management system.</p> <p>Compliance with DOE M 435.1-1 §I.2.G.(2) is demonstrated by having the necessary procedures, mechanisms, and training in place to effect shutdown or curtailment of activities which pose an imminent danger or other serious hazard to workers or the public, or are not protective of the environment.</p>	<p>laboratory's corrective action system.</p> <p>The INL-wide procedure addressing shutdown or curtailment of activities as required by DOE Manual 435.1-1 §I.2.G.(2) is LWP-14002.</p>
<p>(1) Order Compliance. Corrective actions shall be implemented whenever necessary to ensure the requirements of DOE O 435.1, <i>Radioactive Waste Management</i>, and this Manual are met.</p> <p>From DOE G 435.1-1 Chapter IV: If a facility or activity can be allowed to operate while a noncompliant or hazardous condition exists, the allowance and any associated limitations must be defined as part of the facility or activity's radioactive waste management basis, identified as a configuration controlled item in a configuration management plan or included in a revision or modification to an operating procedure or similar controlled documentation.</p> <p>Compliance with this requirement is demonstrated if a corrective action system addresses noncompliant or hazardous situations involving low-level waste management facilities in a systematic fashion, and allows identification of problems by all personnel.</p>	<p>See F. above.</p>
<p>(2) Operations Curtailment. Operations shall be curtailed or facilities shut down for failure to establish, maintain, or operate consistent with an approved radioactive waste management basis.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated with a documented system of routine assessments to determine whether waste management activities and facilities are operating in accordance with an approved radioactive waste management basis that provides for graded limitations that can be placed on activities and operations that do not have, or are operating outside of, an approved radioactive waste management basis, including shutdown of the facility.</p>	<p>The approved RWMB establishes the current compliance status at each radioactive waste management facility. Facility assessments are scheduled to ensure waste management activities are conducted in accordance with the approved RWMB.</p>
<p>G. <u>Waste Acceptance</u>. The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(6)].</p>	<p>DOE Manual 435.1-1 §I.2.F(6) applies to field element managers.</p>
<p>(1) Technical and Administrative. Waste acceptance requirements for all low-level waste storage, treatment,</p>	<p>EDF-7862 establishes the facility as a LTHC3 facility.</p>

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>or disposal facilities, operations, and activities shall specify, at a minimum, the following:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with these waste acceptance requirements is demonstrated if they are documented, contain clear and precise criteria specifying the radionuclide limits in the form of contents or concentrations that can be accepted, the limitations and prohibitions on waste forms and packages that can be received, and the limits, prohibitions, or instructions concerning any other technical information so that the waste is compatible with the safety basis of the facility, and which will result in acceptable waste at subsequent steps in managing the low-level waste.</p>	<p>IAG-IF-657 requires the facility manager to implement a method of tracking and controlling the radioactive material inventory so that the sum-of-the-ratios does not exceed 1. Appendix A, Section 1.1.1 outlines requirements for controlling radiological material inventories.</p> <p>The RMSA custodian manages LLW in accordance with MCP-17000 and LWP-15011.</p>
(a) Allowable activities and/or concentrations of specific radionuclides.	See (1) above.
(b) Acceptable waste form and/or container requirements that ensure the chemical and physical stability of waste under conditions that might be encountered during transportation, storage, treatment, or disposal.	See (1) above.
(c) Restrictions or prohibitions on waste, materials, or containers that may adversely affect waste handlers or compromise facility or waste container performance.	See (1) above.
(d) The following are additional waste acceptance requirements that shall be specified in low-level waste disposal facility waste acceptance requirements:	See (1) above.
1 Low-level waste must contribute to and not detract from achieving long-term stability of the facility, minimizing the need for long-term active maintenance, minimizing subsidence, and minimizing contact of water with waste. Void spaces within the waste and, if containers are used, between the waste and its container shall be reduced to the extent practical.	See (1) above.
2 Liquid low-level waste or low-level waste containing free liquid must be converted into a form that contains as little freestanding liquid as is reasonably achievable, but in no case shall the liquid exceed 1 percent of the waste volume when the low-level waste is in a disposal container, or 0.5 percent of the waste volume after it is processed to a stable form.	See (1) above.
3 Low-level waste must not be readily capable of detonation or of explosive decomposition or reaction at anticipated pressures and temperatures, or of explosive reaction with water. Pyrophoric materials contained in waste shall be treated, prepared, and packaged to be nonflammable.	See (1) above.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
4 Low-level waste must not contain, or be capable of generating by radiolysis or biodegradation, quantities of toxic gases, vapors, or fumes harmful to the public or workers or disposal facility personnel, or harmful to the long-term structural stability of the disposal site.	See (1) above.
5 Low-level waste in a gaseous form must be packaged such that the pressure does not exceed 1.5 atmospheres absolute at 20 C. <i>[sic]</i>	See (1) above.
<p>(e) The basis, procedures, and levels of authority required for granting exceptions to the waste acceptance requirements, which shall be contained in each facility's waste acceptance documentation. Each exception request shall be documented, including its disposition as approved or not approved.</p> <p>From DOE G 435.1-1 Chapter IV: Waste acceptance requirements are acceptable if they are documented and contain a clear description of the procedure and bases for obtaining an exception or deviation to the acceptance criteria for low-level waste to be received at the facility.</p>	See (1) above.
<p>(2) Evaluation and Acceptance. The receiving facility shall evaluate waste for acceptance, including confirmation that the technical and administrative requirements have been met. A process for the disposition of non-conforming wastes shall be established.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the waste acceptance requirements for a low-level waste management facility is demonstrated if they include a process for evaluation and acceptance of incoming waste to ensure the acceptance criteria of the facility receiving the waste are met that includes one of or a combination of: (1) testing, sampling, and analysis of representative samples of waste upon receipt; (2) testing, sampling, and analysis of split samples of waste taken at the generator site; (3) evaluation of testing, sampling, and analysis of data provided by the generator, or (4) audits, reviews, surveillance, or observations of generator waste certification programs and characterization activities. Additionally, acceptable waste acceptance requirements for a storage, treatment or disposal facility will have documented procedures and actions to be taken if a waste that does not conform to the waste acceptance criteria is received at the facility.</p>	See (1) above.
H. <u>Waste Generation Planning</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(7)].	DOE Manual 435.1-1 §I.2.F(7) applies to field element managers.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>(1) Life-Cycle Planning. Prior to waste generation, planning shall be performed to address the entire life cycle for all low-level waste streams.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this planning requirement is demonstrated by the individual sites establishing a process for evaluating the life-cycle of low-level waste prior to its generation, including the identification of low-level wastes with no path to disposal and appropriate records justifying the newly generated low-level waste stream(s), and site personnel possessing planning information showing the location(s) where low-level waste will be stored, treated, and/or disposed along with a confirmation that the personnel managing the facilities agree that the low-level waste may be managed at those facilities.</p>	PDD-17000 and LWP-17000 provide direction to the waste generators for waste generation planning to address the entire life cycle.
<p>(2) Waste with No Identified Path to Disposal. Low-level waste streams with no identified path to disposal shall be generated only in accordance with approved conditions which, at a minimum, shall address:</p>	This facility is not generating radioactive waste that does not have an identified path to disposal.
(a) Programmatic need to generate the waste;	See (2) above.
(b) Characteristics and issues preventing the disposal of the waste;	See (2) above.
(c) Safe storage of the waste until disposal can be achieved; and	See (2) above.
(d) Activities and plans for achieving final disposal of the waste.	See (2) above.
<p>I. <u>Waste Characterization</u>. Low-level waste shall be characterized using direct or indirect methods, and the characterization documented in sufficient detail to ensure safe management and compliance with the waste acceptance requirements of the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program for documenting and the existence of records that document the process for acquiring and verifying the validity of low-level waste characterization data acquired through the use of direct or indirect methods.</p>	MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.
<p>(1) Data Quality Objectives. The data quality objectives process, or a comparable process, shall be used for identifying characterization parameters and acceptable uncertainty in characterization data.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the documented use of a data quality objectives or a comparable process</p>	Radioactive waste management facilities characterize waste in accordance with the requirements of the receiving storage, treatment, or disposal facility. The documented use of a data quality objectives process, or comparable process, was not identified for this facility.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
for determining the type, quantity, and quality of characterization data needed to safely manage low-level waste.	
<p>(2) Minimum Waste Characterization. Characterization data shall, at a minimum, include the following information relevant to the management of the waste:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the existence of a program or procedure for determining and records that document characterization of low-level waste consistent with the minimum characterization data requirements.</p>	MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste characterization information.
(a) Physical and chemical characteristics;	See (2) above.
(b) Volume, including the waste and any stabilization or absorbent media;	See (2) above.
(c) Weight of the container and contents;	See (2) above.
(d) Identities, activities, and concentrations of major radionuclides;	See (2) above.
(e) Characterization date;	See (2) above.
(f) Generating source; and	See (2) above.
(g) Any other information which may be needed to prepare and maintain the disposal facility performance assessment, or demonstrate compliance with applicable performance objectives.	See (2) above.
<p>J. <u>Waste Certification</u>. A waste certification program shall be developed, documented, and implemented to ensure that the waste acceptance requirements of facilities receiving low-level waste for storage, treatment, and disposal are met.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the development and documentation portion of the certification requirement is demonstrated by a waste certification plan that identifies the organizations involved, assigns responsibilities for implementing the program, and describes or references the quality assurance, training, procurement controls, records management, and procedures to be used by the program. Acceptable performance for implementing the program is demonstrated when appropriate personnel are trained and follow the procedures that govern their part of the waste certification. Additionally, acceptable performance is demonstrated if the waste certification plan and procedures are current and controlled in accordance with a document controls program, and records related to certification</p>	<p>MCP-17000 §4 specifies the requirements for preparing an IWTS profile that captures waste certification information.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p> <p>Container procurement is addressed in MCP-17000 §4.6.</p> <p>Waste certification is performed and tracked using IWTS. Documentation of the IWTS Program is available electronically only.</p> <p>PLN-522 requires waste technical specialists and waste disposition specialists to complete the appropriate training/qualification before being granted approval authority for profiles within the IWTS Program. The waste certification official, alternate waste certification official, and NNSS packaging certifiers must complete the appropriate training/qualifications to disposition waste to NNSS.</p>

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
(e.g., certification statements, training records, procurement records, characterization records, container records) are generated and managed in accordance with the established site program.	
<p>(1) Certification Program. The waste certification program shall designate the officials who have the authority to certify and release waste for shipment; and specify what documentation is required for waste generation, characterization, shipment, and certification. The program shall provide requirements for auditability, retrievability, and storage of required documentation and specify the records retention period.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure for record keeping and records showing that low-level waste is certified as having met the waste acceptance criteria of the facility to which it was transferred and that the certification statement is supported by additional records regarding the waste source, characterization, and container.</p>	See J. above.
<p>(2) Certification before Transfer. Low-level waste shall be certified as meeting waste acceptance requirements before it is transferred to the facility receiving the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by the presence of a certification program which includes procedures requiring a signed certification statement prior to the release of waste for transfer, and by dated records showing that waste was certified before being transferred.</p>	See J. above.
<p>(3) Maintaining Certification. Low-level waste that has been certified as meeting the waste acceptance requirements for transfer to a storage, treatment, or disposal facility shall be managed in a manner that maintains its certification status.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by a program or procedure reflecting this requirement is present and site personnel are able to show that the storage of low-level waste containers is in a facility or manner where the containers would not be damaged by normal weather events, and cannot be accessed by unauthorized personnel. Further, each container can be traced to its certification and the information supporting that certification.</p>	See J. above.
K. <u>Waste Transfer</u> . A documented process shall be established and implemented for transferring	MCP-17000 specifies the requirements for preparing an IWTS profile that captures waste certification data,

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>responsibility for management of low-level waste and for ensuring availability of relevant data. The following requirements are in addition to those in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if facilities have procedures for the receipt of waste and the transfer of waste, as appropriate, which address the acquisition of waste and container data and the transfer of ownership, respectively. Further evidence of acceptable performance is facility records showing that data on the waste containers is available and accurate, and that documented transfer of responsibility occurs.</p>	<p>transfer information, and associated authorizations.</p> <p>MCP-17500 provides the WGS waste certification program for LLW to be shipped to NNSS.</p>
<p>(1) Authorization. Low-level waste shall not be transferred to a storage, treatment, or disposal facility until personnel responsible for the facility receiving the waste authorize the transfer.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by sites having procedures that require a confirmation of authorization before releasing waste for transfer, and records showing that transfers are made in accordance with written authorizations.</p>	See K. above.
<p>(2) Data. Waste characterization data, container information, and generation, storage, treatment, and transportation information for low-level waste shall be transferred with or be traceable to the waste.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated if there are procedures requiring that characterization and container data be provided and maintained for each low-level waste transfer and documented records of transfers show that the information is being provided.</p>	See K. above.
<p><u>L. Packaging and Transportation.</u> The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(11)].</p>	DOE Manual 435.1-1 §I.1.E(11) applies to Field element managers.
<p>(1) Packaging. If containers are used:</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with the packaging requirement is demonstrated by: (1) procedures which document proper packaging protocols; and (2) no trends of routine repackaging of low-level waste that is packaged after issuance of DOE O 435.1. Successful performance of this requirement is also demonstrated by a record of containers for which failure has not routinely occurred under management conditions. It is recognized that there may be failed containers for waste previously placed in storage. For</p>	MCP-1700 §4. addresses packaging requirements.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
those containers, the goal is to only have to repackage the waste one time after it is retrieved and characterized. Further, acceptable performance is demonstrated by containers of waste having marking and labeling that allows correlation with waste characterization data and container information.	
(a) Low-level waste shall be packaged in a manner that provides containment and protection for the duration of the anticipated storage period and until disposal is achieved or until the waste has been removed from the container.	See (1) above.
(b) When waste is packaged, vents or other measures shall be provided if the potential exists for pressurizing or generating flammable or explosive concentrations of gases within the waste container.	See (1) above.
(c) Containers of low-level waste shall be marked such that their contents can be identified.	See (1) above.
(2) Transportation. To the extent practical, the volume of waste and number of low-level waste shipments shall be minimized. From DOE G 435.1-1 Chapter IV: Compliance with this requirement can be demonstrated by a combination of site procedures directing the efficient use of waste container capacity and documentation showing that low-level waste shipments are systematically planned and optimized to the extent practical.	MCP-17000 §4 addresses transportation. The waste disposition specialist coordinates with packaging and transportation personnel for waste shipped offsite from this facility. Waste is shipped directly to NNSS from this facility. MCP-17500 specifies waste certification official and waste disposition specialist responsibilities and coordination with packaging and transportation personnel.
M. <u>Site Evaluation and Facility Design</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this requirement addresses new radioactive waste management facilities.
(1) Site Evaluation. Proposed locations for low-level waste facilities shall be evaluated to identify relevant features that should be avoided or must be considered in facility design and analyses.	See M. above.
(a) Each site proposed for a new low-level waste facility or expansion of an existing low-level waste facility shall be evaluated considering environmental characteristics, geotechnical characteristics, and human activities, including for a low-level waste disposal facility, the capability of the site to demonstrate, at a minimum, whether it is:	See M. above.
1 Located to accommodate the projected volume of waste to be received;	See M. above.
2 Located in a flood plain, a tectonically active area, or in the zone of water table fluctuation; and	See M. above.
3 Located where radionuclide migration pathways are	See M. above.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
predictable and erosion and surface runoff can be controlled.	
(b) Proposed sites with environmental characteristics, geotechnical characteristics, and human activities for which adequate protection cannot be provided through facility design shall be deemed unsuitable for the location of the facility.	See M. above.
(c) Low-level waste disposal facilities shall be sited to achieve long-term stability and to minimize, to the extent practical, the need for active maintenance following final closure.	See M. above.
(2) Low-Level Waste Treatment and Storage Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	See M. above.
1 Design of low-level waste treatment and storage facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a non-flammable and nonexplosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Consideration of Decontamination and Decommissioning. Areas in new and modifications to existing low-level waste management facilities that are subject to contamination with radioactive or other hazardous materials shall be designed to facilitate decontamination. For such facilities a proposed decommissioning method or a conversion method leading to reuse shall be described.	See M. above.
(d) Instrumentation and Control Systems. Engineering controls shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide volume inventory data and to prevent spills, leaks, and overflows from tanks or confinement systems.	See M. above.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
(e) Monitoring. Monitoring and/or leak detection capabilities shall be incorporated in the design and engineering of low-level waste treatment and storage facilities to provide rapid identification of failed confinement and/or other abnormal conditions.	See M. above.
(3) Low-Level Waste Disposal Facility Design. The following facility requirements and general design criteria, at a minimum, apply:	See M. above.
(a) Confinement. Low-level waste systems and components shall be designed to maintain waste confinement.	See M. above.
(b) Ventilation.	
1 Design of low-level waste disposal facilities shall include ventilation, if applicable, through an appropriate filtration system to maintain the release of radioactive material in airborne effluents within the requirements and guidelines specified in applicable requirements.	See M. above.
2 When conditions exist for generating gases in flammable or explosive concentrations, ventilation systems or other measures shall be provided to keep the gases in a nonflammable and non-explosive condition. Where concentrations of explosive or flammable gases are expected to approach the lower flammability limit, measures shall be taken to prevent deflagration or detonation.	See M. above.
(c) Stability. Low-level waste disposal facilities shall be designed to achieve long-term stability and to minimize to the extent practical, the need for active maintenance following final closure.	See M. above.
(d) Control of Water. Low-level waste disposal facilities shall be designed to minimize to the extent practical, the contact of waste with water during and after disposal.	See M. above.
N. <u>Storage and Staging</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.2.F(13)].	DOE M 435.1-1 §I.2.F(13) applies to field element managers.
(1) Storage Prohibitions. Low-level waste in storage shall not be readily capable of detonation, explosive decomposition, reaction at anticipated pressures and temperatures, or explosive reaction with water. Prior to storage, pyrophoric materials shall be treated, prepared, and packaged to be nonflammable. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by having waste	IAG-IF-657, Appendix A addresses limitations on chemicals that can be stored in the facility. The NNSS waste acceptance criteria does not allow such waste (MCP-17500); therefore, such waste would not be stored at this facility.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
acceptance requirements which prohibit low-level waste that is ignitable or explosive from being accepted for storage unless it has been treated, and procedures for properly preparing such materials for safe storage.	
<p>(2) Storage Limit. Low-level waste that has an identified path to disposal shall not be stored longer than one year prior to disposal, except for storage for decay, or as otherwise authorized by the Field Element Manager.</p> <p>From DOE G 435.1-1 Chapter IV: Storage longer than one year can be justified if the conditions for such storage are approved by the Field Element Manager as part of the radioactive waste management basis for the facility.</p> <p>Storage for radioactive decay for a period greater than 1 year for waste that has an identified path to disposal is allowed. Adequate justification and the supporting information for storage for decay is to be documented in the radioactive waste management basis for the facility in which the storage will take place.</p> <p><u>Mixed waste.</u> Under the Federal Facility Compliance Act of 1992, DOE sites were required to develop Site Treatment Plans to bring stored mixed low-level waste into compliance with these requirements. The Site Treatment Plan needs to be consulted and any mixed low-level waste stored for the purpose of accumulation to facilitate treatment must meet Resource Conservation and Recovery Act storage requirements. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement and include appropriate provisions in the radioactive waste management basis for the facility in which it is stored.</p> <p><u>Legacy waste.</u> As discussed above, the intention of the requirement is not to force malicious compliance or heroic actions which would result in increased risk or safety concerns. Rather, the intention is that waste in storage longer than one year receives additional attention to ensure that the public, the workers, and the environment are protected from the hazards of the waste, and that progress is being made to dispose of the waste. There could be several ways within different scenarios that this requirement can be met, as illustrated by the examples below, however, there are basically four ways to show compliance with the requirement:</p> <p>1) the radioactive waste management basis allows for</p>	<p>MCP-17000 §4.8.16 addresses storage time limits and waste that is to be stored longer than 1 year. Legacy remote-handled LLW is stored at this facility.</p>

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
<p>storage for no more than one year.</p> <p>2) the radioactive waste management basis allows for storage for no more than one year, or for storage for decay only for periods greater than a year, which are specified on a radionuclide basis.</p> <p>3) the radioactive waste management basis allows for storage for more than one year, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>4) the radioactive waste management basis allows for storage for decay (with specifics) and for storage for more than one year for other low-level waste, up to a specified period of time based on a documented technical evaluation that the waste can be stored in a manner that does not cause changes to the waste or waste packages that is detrimental to the safe storage of the waste, the final disposal of the waste or to meeting the disposal performance objectives.</p> <p>Compliance with this requirement is demonstrated by the existence of a radioactive waste management basis for the storage facility approved by the Field Element Manager that includes the time frames that waste are allowed to be stored, the necessary justifications for storage for decay, and the necessary technical evaluations if storage is to extend significantly beyond the one-year time frame.</p>	
<p>(3) Storage Integrity. Low-level waste shall be stored in a location and manner that protects the integrity of waste for the expected time of storage and minimizes worker exposure.</p> <p>From DOE G 435.1-1 Chapter IV: However, in making a decision to use a facility for storage and in developing a radioactive waste management basis for the activity, particular attention to protection of workers is needed.</p> <p>Compliance with this requirement is demonstrated if sites have storage capabilities for low-level waste that provide protection to waste containers so that their integrity will not be damaged through physical or chemical (corrosion) processes and that keep personnel from spending extended periods of time in the areas where low-level waste is stored.</p>	<p>LWP-15011 §5 provides general radioactive storage area requirements and §5.1.7 addresses outdoor storage of radioactive material.</p>
(4) Waste Characterization for Storage.	See below.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
(a) Low-level waste that does not have an identified path to disposal shall be characterized as necessary to meet the data quality objectives and minimum characterization requirements of this Chapter, to ensure safe storage, and to facilitate disposal.	This facility does not store LLW that does not have an identified path to disposal.
<p>(b) Characterization information for all low-level waste in storage shall be maintained as a record in accordance with the requirements for Records Management in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by documented procedures for managing waste characterization and container information on low-level waste as a Federal record. The records are managed per the applicable policies and procedures for records management referenced in DOE O 200.1 and established at the applicable Field Element.</p>	MCP-17000 §§4 and 5 address the use of IWTS and records.
<p>(5) Container Inspection. A process shall be developed and implemented for inspecting and maintaining containers of low-level waste to ensure container integrity is not compromised.</p> <p>From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated by: (1) a documented process for waste container inspection and maintenance; and (2) documentation for all waste container inspections and maintenance actions performed.</p>	LI-435 requires quarterly inspections of radioactive waste containers if waste is stored outdoors or has been in storage for greater than one year.
(6) Storage Management. Low-level waste storage shall be managed to identify and segregate low-level waste from mixed low-level waste.	MCP-17000 requires segregation of waste by container with §4.7, requiring the use of a unique IWTS bar code for each container.
<p>(7) Staging. Staging of low-level waste shall be for the purpose of the accumulation of such quantities of waste as necessary to facilitate transportation, treatment, and disposal. Staging longer than 90 days shall meet the requirements for storage above and in Chapter I of this Manual.</p> <p>From DOE G 435.1-1 Chapter IV: The staging of low-level waste needs to be addressed in the radioactive waste management basis for the facility that is performing the staging. Generators, treatment facilities, and disposal facilities that stage waste must ensure that the action of staging is included and authorized as part of their radioactive waste management basis for the affected facilities, operations, or activities.</p> <p>Staging longer than 90 days must be justified, the conditions for such storage met, and these practices approved by the Field Element Manager as part of the</p>	NA; this facility does not stage LLW.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
radioactive waste management basis for the facility. Compliance with this requirement is demonstrated by a staging program that limits the temporary storage of waste to only circumstances allowed in the requirement, including justifications for any staging that exceeds the 90-day period, which is documented in the radioactive waste management basis for the facility.	
O. <u>Treatment</u> . Low-level waste treatment to provide more stable waste forms and to improve the long-term performance of a low-level waste disposal facility shall be implemented as necessary to meet the performance objectives of the disposal facility. From DOE G 435.1-1 Chapter IV: Compliance with this requirement is demonstrated when a treatment facility or process ensures that treated waste will meet the minimum waste form requirements of DOE M 435.1 and meet additional disposal facility-specific waste acceptance requirements for additional stability or long-term performance of facilities that will receive the treated waste.	NA; this facility does not treat LLW.
P. <u>Disposal</u> . Low-level waste disposal facilities shall meet the following requirements.	NA; this facility does not dispose of LLW.
(1) Performance Objectives. Low-level waste disposal facilities shall be sited, designed, operated, maintained, and closed so that a reasonable expectation exists that the following performance objectives will be met for waste disposed of after September 26, 1988:	See P. above.
(a) Dose to representative members of the public shall not exceed 25 mrem (0.25 mSv) in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air.	See P. above.
(b) Dose to representative members of the public via the air pathway shall not exceed 10 mrem (0.10 mSv) in a year total effective dose equivalent, excluding the dose from radon and its progeny.	See P. above.
(c) Release of radon shall be less than an average flux of 20 pCi/m ² /s (0.74Bq/m ² /s) at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/l (0.0185 Bq/l) of air may be applied at the boundary of the facility.	See P. above.
(2) Performance Assessment. A site-specific radiological performance assessment shall be prepared and maintained for DOE low-level waste disposed of after September 26, 1988. The performance assessment shall include calculations for a 1,000 year period after closure of potential doses to representative future members of the public and potential releases from the	See P. above.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
facility to provide a reasonable expectation that the performance objectives identified in this Chapter are not exceeded as a result of operation and closure of the facility.	
(a) Analyses performed to demonstrate compliance with the performance objectives in this Chapter, and to establish limits on concentrations of radionuclides for disposal based on the performance measures for inadvertent intruders in this Chapter shall be based on reasonable activities in the critical group of exposed individuals. Unless otherwise specified, the assumption of average living habits and exposure conditions in representative critical groups of individuals projected to receive the highest doses is appropriate. The likelihood of inadvertent intruder scenarios may be considered in interpreting the results of the analyses and establishing radionuclide concentrations, if adequate justification is provided.	See P. above.
(b) The point of compliance shall correspond to the point of highest projected dose or concentration beyond a 100 meter buffer zone surrounding the disposed waste. A larger or smaller buffer zone may be used if adequate justification is provided.	See P. above.
(c) Performance assessments shall address reasonably foreseeable natural processes that might disrupt barriers against release and transport of radioactive materials.	See P. above.
(d) Performance assessments shall use DOE-approved dose coefficients (dose conversion factors) for internal and external exposure of reference adults.	See P. above.
(e) The performance assessment shall include a sensitivity/uncertainty analysis.	See P. above.
(f) Performance assessments shall include a demonstration that projected releases of radionuclides to the environment shall be maintained as low as reasonably achievable (ALARA).	See P. above.
(g) For purposes of establishing limits on radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts to water resources.	See P. above.
(h) For purposes of establishing limits on the concentration of radionuclides that may be disposed of near-surface, the performance assessment shall include an assessment of impacts calculated for a hypothetical person assumed to inadvertently intrude for a temporary period into the low-level waste disposal	See P. above.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
facility. For intruder analyses, institutional controls shall be assumed to be effective in deterring intrusion for at least 100 years following closure. The intruder analyses shall use performance measures for chronic and acute exposure scenarios, respectively, of 100 mrem (1 mSv) in a year and 500 mrem (5 mSv) total effective dose equivalent excluding radon in air.	
(3) Composite Analysis. For disposal facilities which received waste after September 26, 1988, a site-specific radiological composite analysis shall be prepared and maintained that accounts for all sources of radioactive material that may be left at the DOE site and may interact with the low-level waste disposal facility, contributing to the dose projected to a hypothetical member of the public from the existing or future disposal facilities. Performance measures shall be consistent with DOE requirements for protection of the public and environment and evaluated for a 1,000 year period following disposal facility closure. The composite analysis results shall be used for planning, radiation protection activities, and future use commitments to minimize the likelihood that current low-level waste disposal activities will result in the need for future corrective or remedial actions to adequately protect the public and the environment.	See P. above.
(4) Performance Assessment and Composite Analysis Maintenance. The performance assessment and composite analysis shall be maintained to evaluate changes that could affect the performance, design, and operating bases for the facility. Performance assessment and composite analysis maintenance shall include the conduct of research, field studies, and monitoring needed to address uncertainties or gaps in existing data. The performance assessment shall be updated to support the final facility closure. Additional iterations of the performance assessment and composite analysis shall be conducted as necessary during the post-closure period.	See P. above.
(a) Performance assessments and composite analyses shall be reviewed and revised when changes in waste forms or containers, radionuclide inventories, facility design and operations, closure concepts, or the improved understanding of the performance of the waste disposal facility in combination with the features of the site on which it is located alter the conclusions or the conceptual model(s) of the existing performance assessment or composite analysis.	See P. above.
(b) A determination of the continued adequacy of the performance assessment and composite analysis shall	See P. above.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
be made on an annual basis, and shall consider the results of data collection and analysis from research, field studies, and monitoring.	
(c) Annual summaries of low-level waste disposal operations shall be prepared with respect to the conclusions and recommendations of the performance assessment and composite analysis and a determination of the need to revise the performance assessment or composite analysis.	See P. above.
(5) Disposal Authorization. A disposal authorization statement shall be obtained prior to construction of a new low-level waste disposal facility. Field Elements with existing low-level waste disposal facilities shall obtain a disposal authorization statement in accordance with the schedule in the Complex-Wide Low-Level Waste Management Program Plan. The disposal authorization statement shall be issued based on a review of the facility's performance assessment, composite analysis, performance assessment and composite analysis maintenance, preliminary closure plan, and preliminary monitoring plan. The disposal authorization statement shall specify the limits and conditions on construction, design, operations, and closure of the low-level waste facility based on these reviews. A disposal authorization statement is a part of the radioactive waste management basis for a disposal facility. Failure to obtain a disposal authorization statement by the implementation date of this Order shall result in shutdown of the disposal facility.	See P. above.
(6) Disposal Facility Operations. The disposal facility design and operation must be consistent with the disposal facility closure plan and lead to disposal facility closure that provides a reasonable expectation that performance objectives will be met. Low-level waste shall be disposed in such a manner that achieves the performance objectives stated in this Chapter, consistent with the disposal facility radiological performance assessment. Additional requirements include:	See P. above.
(a) Operating procedures shall be developed and implemented for low-level waste disposal facilities that protect the public, workers, and the environment; ensure the security of the facility; minimize subsidence during and after waste emplacement; achieve long-term stability and minimize the need for long-term active maintenance; and meet the requirements of the closure/post-closure plan.	See P. above.
(b) Permanent identification markers for disposal excavations and monitoring wells shall be emplaced.	See P. above.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
(c) Low-level waste placement into disposal units shall minimize voids between waste containers. Voids within disposal units shall be filled to the extent practical. Uncontainerized bulk waste shall also be placed in a manner that minimizes voids and subsidence.	See P. above.
(d) Operations are to be conducted so that active waste disposal operations will not have an adverse effect on any other disposal units.	See P. above.
(e) Operations shall include a process for tracking and documenting low-level waste placement in the facility by generator source.	See P. above.
(7) Alternate Requirements for Low-Level Waste Disposal Facility Design and Operation. Requirements other than those set forth in this Section for the design and operation of a low-level waste disposal facility may be approved on a specific basis if a reasonable expectation is demonstrated that the disposal performance objectives will be met.	See P. above.
Q. <u>Closure</u> . The following requirements are in addition to those in Chapter I of this Manual.	NA; this facility does not dispose of LLW.
(1) Disposal Facility Closure Plans. A preliminary closure plan shall be developed and submitted to Headquarters for review with the performance assessment and composite analysis. The closure plan shall be updated following issuance of the disposal authorization statement to incorporate conditions specified in the disposal authorization statement. Closure plans shall:	See Q. above.
(a) Be updated as required during the operational life of the facility.	See Q. above.
(b) Include a description of how the disposal facility will be closed to achieve long-term stability and minimize the need for active maintenance following closure and to ensure compliance with the requirements of DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(c) Include the total expected inventory of wastes to be disposed of at the facility over the operational life of the facility.	See Q. above.
(2) Disposal Facility Closure. Closure of a disposal facility shall occur within a five-year period after it is filled to capacity, or after the facility is otherwise determined to be no longer needed.	See Q. above.
(a) Prior to facility closure, the final inventory of the low-level waste disposed in the facility shall be	See Q. above.

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
prepared and incorporated in the performance assessment and composite analysis which shall be updated to support the closure of the facility.	
(b) A final closure plan shall be prepared based on the final inventory of waste disposed in the facility, the plan implemented, and the updated performance assessment and composite analysis prepared in support of the facility closure.	See Q. above.
(c) Institutional control measures shall be integrated into land use and stewardship plans and programs, and shall continue until the facility can be released pursuant to DOE 5400.5, <i>Radiation Protection of the Public and the Environment</i> .	See Q. above.
(d) The location and use of the facility shall be filed with the local authorities responsible for land use and zoning.	See Q. above.
R. <u>Monitoring</u> . The following requirements are in addition to those in Chapter I of this Manual [DOE M 435.1-1 §I.1.E(7)].	DOE Manual 435.1-1 §I.1.E(7) applies to field element managers.
<p>(1) All Waste Facilities. Parameters that shall be sampled or monitored, at a minimum, include: temperature, pressure (for closed systems), radioactivity in ventilation exhaust and liquid effluent streams, and flammable or explosive mixtures of gases. Facility monitoring programs shall include verification that passive and active control systems have not failed.</p> <p>From DOE G 435.1-1 Chapter IV: The minimum parameters specified in the requirement were selected based on their potential significance for anticipating and identifying undesirable conditions at low-level waste management facilities. Each facility's radioactive waste management basis should include an evaluation of the applicability and significance of the minimum parameters. This evaluation also needs to consider additional parameters to be sampled or monitored to ensure the protection of the public health, the environment, and the workers. If a minimum parameter specified in the requirement is deemed to be not applicable in any way to the active operation of that facility, then that justification should be included in the radioactive waste management basis and when approved constitutes an exemption to the manual.</p> <p>Verification activities are part of the radioactive waste management basis as a condition for operation and documented appropriately.</p> <p>Compliance with this requirement is demonstrated if monitoring or sampling for the stated parameters is</p>	<p>Monitoring requirements at INL radioactive waste management facilities are tailored for the specific facility to enable timely indication of developing problems. Existing radiological control procedures and assessments are followed/completed to monitor waste facilities.</p> <p>LRD-15001 and MCP-139 specify methods and frequency of radiological control surveys of all radiological areas. MCP-139 specifies the use of Form 441.A34. This form is referred to as the "routine sheet" and is to be used by facility radiological control foremen to list radiological areas that are to be surveyed, the survey periods, and methods.</p>

Table 6. (continued).

Facility Name: IF-657, Radioactive Waste Storage Area	
Chapter IV, LLW Requirements	Facility Compliance Information
performed for all facilities with a precision, accuracy, and frequency consistent with timely identification of developing problems and a justification exists in the approved radioactive waste management basis for those specified parameters which are not monitored or sampled.	
(2) Liquid Waste Storage Facilities. For facilities storing liquid low-level waste, the following shall also be monitored: liquid level and/or waste volume, and significant waste chemistry parameters.	NA; liquid LLW is not stored in this facility.
(3) Disposal Facilities. A preliminary monitoring plan for a low-level waste disposal facility shall be prepared and submitted to Headquarters for review with the performance assessment and composite analysis. The monitoring plan shall be updated within one year following issuance of the disposal authorization statement to incorporate and implement conditions specified in the disposal authorization statement.	NA; this facility does not dispose of LLW.
(a) The site-specific performance assessment and composite analysis shall be used to determine the media, locations, radionuclides, and other substances to be monitored.	See (3) above.
(b) The environmental monitoring program shall be designed to include measuring and evaluating releases, migration of radionuclides, disposal unit subsidence, and changes in disposal facility and disposal site parameters which may affect long-term performance.	See (3) above.
(c) The environmental monitoring programs shall be capable of detecting changing trends in performance to allow application of any necessary corrective action prior to exceeding the performance objectives in this Chapter.	See (3) above.

5. REFERENCES

- 1227-07-IRC, "Microbial Research Using Solvents, Hazardous Metals and Radionuclides," Idaho National Laboratory.
- 1456-08-REC, "General Purpose Ultratrace Analytical Chemistry," Idaho National Laboratory.
- 1507-08-SAF, "Determination of Ultratrace Levels of Iodine," Idaho National Laboratory.
- 1577-09-IRC, "Irradiated Graphite Characterization Laboratory Instructions," Idaho National Laboratory.
- DOE Guide 435.1-1, "Implementation Guide for Use with DOE M 435.1-1," U.S. Department of Energy, July 1999.
- DOE Manual 435.1-1, "Radioactive Waste Management Manual," U.S. Department of Energy, July 1999.
- DOE Order 435.1, "Radioactive Waste Management," U.S. Department of Energy, July 1999.

EDF-7862, "Hazard Classification for the INL Research Center (IRC)," Idaho National Laboratory.

Form 441.A34, "INL Radiological Control Required Surveys," Idaho National Laboratory.

IAG-IF-657, "Tenant Use Agreement Between Facility Management Services at the Research and Education Campus (REC) and Science and Technology Tenants at INL Research Campus (IRC) IF-657, INL Engineering Demonstration Facility (IEDF)," Idaho National Laboratory.

IAG-IF-603, "Tenant Use Agreement Between Operations and Maintenance Services and Research and Development (R&D) Tenants at the Science and Technology Campus (STC) IF-603 INL Research Campus Laboratory Building (IRC-L)," Idaho National Laboratory.

LI-435, "Waste Management Routine Field Activities," Idaho National Laboratory.

LRD-15001, "Radiological Control Manual," Idaho National Laboratory.

LWP-8000, "Environmental Instructions for Facilities, Processes, Materials and Equipment," Idaho National Laboratory.

LWP-13840, "Management of Issues, Observations, and Noteworthy Practices," Idaho National Laboratory.

LWP-14002, "Timeout and Stop Work Authority," Idaho National Laboratory

LWP-15011, "Radioactive Material Areas and Radioactive Storage Areas," Idaho National Laboratory.

LWP-17000, "Waste Management," Idaho National Laboratory.

MCP-139, "Radiological Surveys," Idaho National Laboratory.

MCP-17000, "Waste Generator Services Waste Management," Idaho National Laboratory.

MCP-17410, "Management of Waste Storage Areas," Idaho National Laboratory.

MCP-17500, "Waste Generator Services Certification of Waste Shipments to the Nevada Test Site," Idaho National Laboratory.

PDD-17000, "Waste Management Program," Idaho National Laboratory.

PLN-114, "INL Emergency Plan/RCRA Contingency Plan," Idaho National Laboratory.

PLN-522, "Quality Assurance Program Plan for the Waste Management/Waste Certification Program," Idaho National Laboratory.

PLN-3655, "Research and Education Campus Radioactive Waste Management Basis," Idaho National Laboratory.